Objective items for integrated science

Book two

LAU HUT YEE

A comprehensive
selection of
objective-type
questions

Longman

Objective items for integrated science

9635

LAU HUT YEE

Book 2

With answers

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Preface

This is the second book in a series of three. The aims of the books are:

1 To help pupils in their self-study and self-revision of work done

2 To reveal to pupils the sections they may be weak in; and in so doing, enable them to improve in these sections

3 To familiarise pupils with the types of questions they will be asked in the final examination; and to give them extensive practice in answering such questions

4 To stimulate discussion among pupils in a class

5 To help teachers evaluate the progress of their pupils regularly and accurately

This second book of objective items closely follows the syllabus and the worksheets for Integrated Science issued by the Ministry of Education for Form Two. The items have been set so as to encourage pupils to make careful and accurate observations during their experiments, and to develop an inquiring mind.

In thinking out the answers to the questions, pupils also revise in an active way the scientific laws, principles and methods they have learnt. Information gathered in this way remains long in the mind of pupils.

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5 Detecting the environment

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1 Solvents and solutions

Water cycle

1 Some crushed ice is put in a test tube which has a thermometer placed in it. The test tube is heated very gently.
Which statements about the experiment are true?

I. The thermometer registers a rise in temperature as the ice melts
II. The thermometer does not register a rise in temperature as the ice melts
III. The thermometer begins to show a rise in temperature only after all the ice has melted
IV. The thermometer registers a temperature of 100°C as soon as all the ice has melted

A. I only
B. II only
C. II and III
D. I and III
E. I and IV

::A:: ::B:: ::C:: ::D:: ::E::

2 When ice is heated it melts because

A. the water particles receive energy and move towards each other
B. the water particles receive energy and move apart
C. the water particles break up into atoms
D. the water particles change their size
E. the water particles change in their structure

::A:: ::B:: ::C:: ::D:: ::E::

3 Steam is cooled.

Which statement on the next page is correct?

A. The steam loses heat energy
B. The steam gains heat energy
C. The steam loses chemical energy
D. The steam gains chemical energy
E. The steam loses electrical energy

::A:: ::B:: ::C:: ::D:: ::E::

4 At what temperature does water begin to turn into ice?

A. 0 °C
B. 1 °C
C. 10 °C
D. 50 °C
E. 100 °C

::A:: ::B:: ::C:: ::D:: ::E::

5 At what temperature does pure water boil?

A. 0 °C
B. 10 °C
C. 50 °C
D. 100 °C
E. above 100 °C

::A:: ::B:: ::C:: ::D:: ::E::

6 A pupil found that the tap water in his laboratory boiled at 101 °C. What caused the tap water to have a higher boiling point?

A. the thermometer
B. heat
C. water vapour
D. dissolved air
E. impurities

::A:: ::B:: ::C:: ::D:: ::E::

7 The ice-cream hawker puts common salt on the ice surrounding his tin of ice-cream. Why does he do this?

A. to lower the temperature of the ice below 0 °C
B. to raise the temperature of the ice above 0 °C
C. to make the ice melt faster

D. to kill germs in the ice
E. to improve the taste of the ice-cream

::A:: ::B:: ::C:: ::D:: ::E::

8 Some moist air is kept under pressure.
What happens if the pressure is suddenly released?

A. The moist air becomes warm
B. The moist air becomes dry
C. The water vapour condenses to form a mist
D. The water vapour gains more energy
E. Nothing happens to the water vapour

::A:: ::B:: ::C:: ::D:: ::E::

9 Which of the following conditions will increase the rate of evaporation from a wet shirt?

I. high temperature
II. dry air
III. strong wind
IV. high humidity

A. I only
B. I and III
C. II and IV
D. I, II and III
E. none of these combinations

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::A:: ::B:: ::C:: ::D:: ::E::

10 Under what conditions will clothes dry fastest?

A. in still cool air
B. in moving cool air
C. in still warm air
D. in moving warm air
E. in moving moist air

::A:: ::B:: ::C:: ::D:: ::E::

11 Five wet handkerchiefs of the same size and material are put out to dry under different conditions. Which handkerchief will dry first?

A. The first handkerchief is spread out and placed on a cool surface in still air
B. The second handkerchief is spread out and placed on a cool surface in moving air
C. The third handkerchief is spread out and placed on a warm surface in still air
D The fourth handkerchief is spread out and placed on a warm surface in moving air
E. The fifth handkerchief is folded and placed on a warm surface in moving air

::A:: ::B:: ::C:: ::D:: ::E::

12 Which statements about evaporation of water are true?

I. During evaporation water particles escape into the air
II. During evaporation water particles combine with other particles
III. Evaporation is faster in a hot place than in a cool place
IV. Evaporation is slower in moving air than in still air

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

13 When a dish of water is left exposed to the air, the water evaporates because

A. some of the water molecules are attracted by other molecules in the air
B. some of the water molecules become lighter
C. some of the water molecules move faster and escape into the air
D. the air molecules attract the water molecules
E. the air molecules combine with the water molecules

::A:: ::B:: ::C:: ::D:: ::E::

14 Choose the correct word for the box.

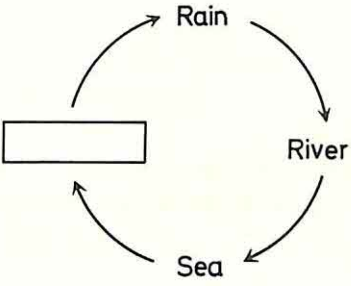

fig 1

A. mist
B. fog
C. snow
D. dew
E. cloud

::A:: ::B:: ::C:: ::D:: ::E::

15 Which statements about the water cycle are true?

I. When water vapour rises up into the sky it becomes cool
II. The water vapour condenses into tiny drops of water
III. The tiny drops of water float in the air as clouds
IV. When the tiny drops of water become big, they fall as rain.

A. I, II and III
B. I and III
C. II and IV
D. all are not true
E. all are true

::A:: ::B:: ::C:: ::D:: ::E::

16 The following things are put in a filter bed:

I. small stones
II. fine sand
III. coarse sand

In which order should the things be placed starting with the topmost layer?

A. I, II, III
B. I, III, II
C. III, II, I
D. II, I, III
E. II, III, I

::A:: ::B:: ::C:: ::D:: ::E::

17 Which of the following cannot be removed from water by filtering the water through a filter bed?

I. microscopic organisms
II. coarse sand
III. suspended pieces of wood
IV. dissolved chemicals

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

18 The first stage in purifying drinking water is usually

A. evaporation
B. filtration
C. distillation
D. fractional distillation
E. boiling

::A:: ::B:: ::C:: ::D:: ::E::

19 Chlorine is

A. a poisonous gas
B. a harmless gas
C. a colourless gas
D. an odourless gas
E. an alkaline gas

::A:: ::B:: ::C:: ::D:: ::E::

20 Chlorine is usually added to water which is supplied to a town. This is done in order to

A. enable the water to be filtered easily
B. make the fine suspension settle
C. decolourise the water
D. kill any germs present
E. remove any smell from the water

::A:: ::B:: ::C:: ::D:: ::E::

21 A chemically pure water is

A. rain water
B. distilled water
C. pond water
D. spring water
E. sea water

::A:: ::B:: ::C:: ::D:: ::E::

22 Equal samples of the following water are evaporated to dryness. Which water has the least residue?

A. pond water
B. river water
C. rain water
D. well water
E. sea water

::A:: ::B:: ::C:: ::D:: ::E::

23 Which statements are true?

I. Drinking water has been filtered
II. Drinking water does not contain any dissolved substances
III. Drinking water has been chlorinated
IV. Drinking water is the same as distilled water

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

24 We can obtain drinking water from sea water by the process of

A. filtration
B. chlorination
C. distillation
D. crystallisation
E. precipitation

::A:: ::B:: ::C:: ::D:: ::E::

25 What process does the following illustrate?

$$\text{water} \xrightarrow{\text{heat}} \text{steam} \xrightarrow{\text{cool}} \text{water}$$

A. distillation
B. filtration
C. chlorination
D. evaporation
E. crystallisation

::A:: ::B:: ::C:: ::D:: ::E::

26 The drinking water which comes to our homes has been

A. filtered only
B. chlorinated only
C. distilled only
D. chlorinated and distilled
E. filtered and chlorinated

::A:: ::B:: ::C:: ::D:: ::E::

27 It is better to drink tap water than distilled water because

A. tap water contains chlorine
B. tap water contains dissolved mineral salts
C. tap water contains bacteria
D. tap water is cleaner
E. tap water has air dissolved in it

::A:: ::B:: ::C:: ::D:: ::E::

28 To distil water, a boy set up the apparatus as shown in the diagram. What is wrong with the experiment?

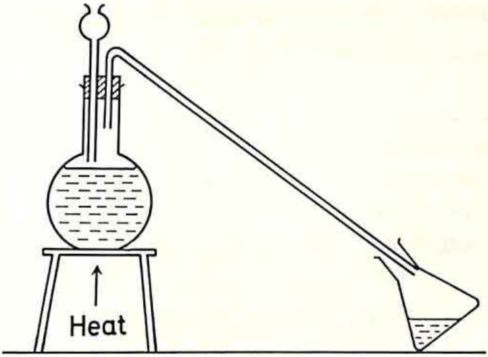

fig 2

A. There is too much water in the flask
B. The receiver should be a beaker
C. The receiver should be cooled by water
D. The thistle funnel should dip into the water
E. The water should not be heated

::A:: ::B:: ::C:: ::D:: ::E::

Solubility and its uses

29 For questions a, b and c, choose the correct answers from the list below.

A. solution
B. suspension
C. solvent
D. solute
E. distillate

::A:: ::B:: ::C:: ::D:: ::E::

Some sugar is dissolved in water.

a. The sweet liquid obtained is called a ...... of sugar in water.

::A:: ::B:: ::C:: ::D:: ::E::

b. The sugar which dissolves in the water is called the ......

::A:: ::B:: ::C:: ::D:: ::E::

c. The water which dissolves the sugar is called the .....

::A:: ::B:: ::C:: ::D:: ::E::

30 When a substance cannot dissolve any more in a solution, the solution is said to be

A. melted
B. saturated
C. crystallised
D. evaporated
E. suspended

::A:: ::B:: ::C:: ::D:: ::E::

31 Choose the correct statements.

I. Different substances dissolve different amounts in equal volumes of water at the same temperature
II. Different substances dissolve the same amount in equal volumes of water at the same temperature
III. A substance dissolves more in a hot liquid than in a cold liquid
IV. A substance dissolves less in a hot liquid than in a cold liquid

A. I and III
B. I and IV
C. II and III
D. II and IV
E. I only

::A:: ::B:: ::C:: ::D:: ::E::

32 A solid dissolves more quickly if

I. it is finely powdered
II. the liquid for dissolving it is heated
III. the mixture is well stirred
IV. the container is big

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

33 When calcium chloride is dissolved in water, the solution is cold. This is because

A. chemical energy is changed to heat energy
B. chemical energy is set free
C. chemical energy is absorbed
D. heat energy is set free
E. heat energy is absorbed

::A:: ::B:: ::C:: ::D:: ::E::

34 When sodium hydroxide pellets are dissolved in water, the solution is hot. This is because

A. heat energy is absorbed
B. heat energy is set free
C. chemical energy is absorbed
D. chemical energy is set free
E. molecules split up

::A:: ::B:: ::C:: ::D:: ::E::

35 Crystals of the same substance have the same

A. weight
B. size
C. mass
D. volume
E. shape

::A:: ::B:: ::C:: ::D:: ::E::

36 A hot saturated solution of sodium nitrate is cooled slowly. What do you observe?

A. A single crystal is formed
B. Many crystals are formed
C. One solid piece of sodium nitrate is formed
D. A suspension is formed
E. The solution changes colour

::A:: ::B:: ::C:: ::D:: ::E::

37 A piece of acetamide is placed on a microscope slide and warmed until it melts. Then it is cooled. What do you observe?

A. A single large crystal is formed
B. Many small crystals are formed
C. A piece of acetamide is formed back again
D. The solution dries up and leaves behind fine powder
E. The solution absorbs water vapour and becomes diluted

::A:: ::B:: ::C:: ::D:: ::E::

38 Crystals may be formed when

I. a hot saturated solution is left to cool
II. a cold saturated solution is slowly evaporated
III. a solid is melted and then left to cool
IV. a solid is dissolved in a hot liquid

A. I, II and III
B. I and III
C. II and IV
D. I only
E. III only

::A:: ::B:: ::C:: ::D:: ::E::

39 Choose the correct statements.

I. Crystals are always rectangular
II. Crystals of different substances have different shapes
III. Some crystals are obtained by heating a substance strongly
IV. Some crystals are obtained by melting a solid and cooling it

A. I, II and III
B. I and III
C. II and IV
D. II only
E. IV only

::A:: ::B:: ::C:: ::D:: ::E::

40 Choose the incorrect statement.

A. When a hot saturated solution is cooled slowly, large crystals are formed
B. When a hot saturated solution is cooled rapidly, many small crystals are formed
C. Crystals of the same substance have the same shape

D. Crystals are coloured and transparent
E. Crystals are natural solids which have a regular shape with flat surfaces and straight edges

::A:: ::B:: ::C:: ::D:: ::E::

41 Which diagram illustrates a crystal of common salt?

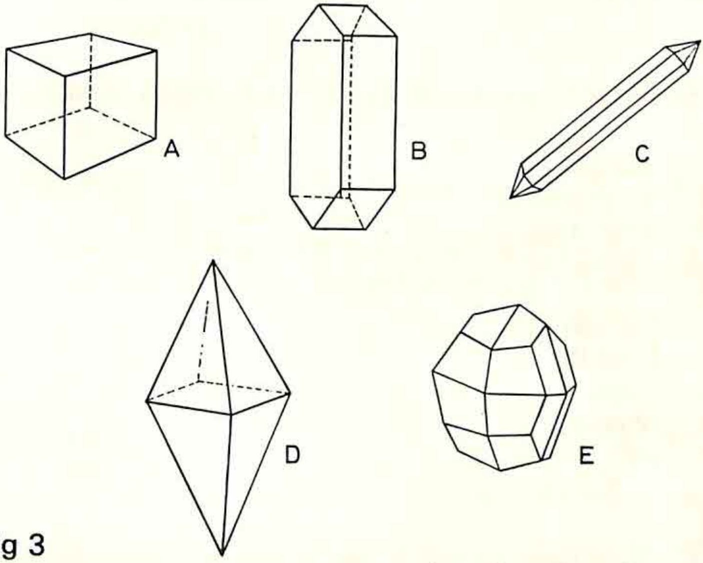

fig 3

::A:: ::B:: ::C:: ::D:: ::E::

42 The iodine solution we use for First Aid is prepared by dissolving iodine in

A. water
B. acetone
C. alcohol
D. kerosene
E. carbon tetrachloride

::A:: ::B:: ::C:: ::D:: ::E::

43 Which substance will you use to remove paint from your clothes?

A. toluene
B. acetone
C. amyl acetate
D. ethyl acetate
E. turpentine

::A:: ::B:: ::C:: ::D:: ::E::

44 Which substance will you use to remove lipstick from your clothes?

A. turpentine
B. toluene
C. carbon tetrachloride
D. acetone
E. water

::A:: ::B:: ::C:: ::D:: ::E::

45 Which substance would remove nail varnish?

I. acetone
II. amyl acetate
III. ethyl acetate
IV. turpentine

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. all

::A:: ::B:: ::C:: ::D:: ::E::

46 The best chemical for removing tar from your hands is

A. soap
B. acid
C. petrol
D. washing soda
E. distilled water

::A:: ::B:: ::C:: ::D:: ::E::

47 Which method can separate a mixture of fine sand and common salt?

A. picking up the salt
B. heating the mixture
C. dissolving the mixture in water and crystallising it
D. dissolving the mixture in water and evaporating it
E. dissolving the mixture in water, filtering it and evaporating the filtrate

::A:: ::B:: ::C:: ::D:: ::E::

48 To find out whether all inks of the same colour contain the same dyes, we can use the process called

A. separation
B. filtration
C. evaporation
D. chromatography
E. photography

::A:: ::B:: ::C:: ::D:: ::E::

49 Chromatography depends on which of the following?

I. Dyes do not have the same solubility
II. Dyes have the same solubility
III. Dyes have different adhesive properties to paper
IV. Dyes have the same adhesive properties to paper

A. I and III
B. I and IV
C. II and III
D. II and IV
E. II only

::A:: ::B:: ::C:: ::D:: ::E::

50 What is the aim of the experiment set up below?

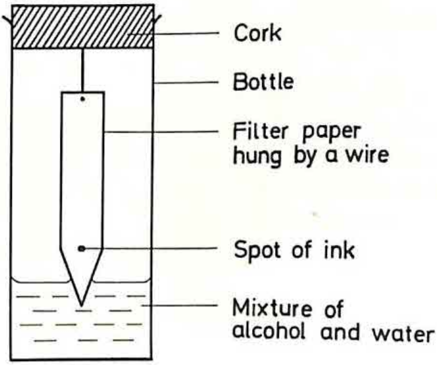

fig 4

A. to find out whether the ink dissolves in alcohol
B. to find out whether the ink dissolves in water
C. to find out whether the mixture rises up the filter paper
D. to find out whether the mixture evaporates
E. to find out the dyes mixed in the ink

::A:: ::B:: ::C:: ::D:: ::E::

Emulsions and colloids

51 A colloid is classified as

A. a class of substance in a particular state of division
B. a class of substance which gives a cloudy appearance when dissolved in water
C. a class of substance which dissolves completely in water
D. a special class of crystals
E. a class of substance which can pass through parchment paper

::A:: ::B:: ::C:: ::D:: ::E::

52 All, except one of the items listed below, can be classified as a colloid. Which item is not a colloid?

A. fog
B. mist
C. cod liver oil
D. hair cream
E. common salt

::A:: ::B:: ::C:: ::D:: ::E::

53 An emulsion, which is one form of colloid, is

A. a solid dispersed in a liquid
B. a liquid dispersed in another liquid
C. a gas dispersed in a liquid
D. a liquid dispersed in a gas
E. a solid dispersed in a gas

::A:: ::B:: ::C:: ::D:: ::E::

54 Choose the statements which are true.

I. An emulsion consists of droplets of liquid distributed evenly in another liquid
II. When two liquids which do not mix are thoroughly shaken, an emulsion is formed
III. Milk is an emulsion of butter and water
IV. Another term for emulsion is true solution

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. all

::A:: ::B:: ::C:: ::D:: ::E::

55 The following experiments are carried out.

I. Oil, water and soap solution are thoroughly shaken
II. Starch powder is thoroughly stirred in boiling water
III. Oil, vinegar and mustard powder are thoroughly shaken
IV. Copper sulphate crystals are stirred in boiling water

a. Which of the above will form emulsions?

A. I, II and III
B. I and III
C. II and IV
D. II only
E. IV only

::A:: ::B:: ::C:: ::D:: ::E::

b. Which of the above will form a true solution?

A. I and III
B. II and IV
C. II only
D. III only
E. IV only

::A:: ::B:: ::C:: ::D:: ::E::

c. Which of the above will form a colloid?

A. I and III
B. II and IV
C. II only
D. IV only
E. none

::A:: ::B:: ::C:: ::D:: ::E::

56 An example of a liquid dispersed in a solid is

A. milk
B. custard
C. foam
D. jelly
E. hair spray

::A:: ::B:: ::C:: ::D:: ::E::

57 An example of a gas dispersed in a liquid is

A. whipped cream
B. mist
C. cloud
D. smoke
E. gold-bearing rock

::A:: ::B:: ::C:: ::D:: ::E::

58 An example of a liquid dispersed in a gas is

A. hair cream
B. tin ore
C. mist
D. smoke
E. starch solution

::A:: ::B:: ::C:: ::D:: ::E::

59 Name the colloid in which a solid is dispersed in a gas.

A. cloud
B. milk
C. salad cream
D. smoke
E. foam

::A:: ::B:: ::C:: ::D:: ::E::

60 A colloid can be distinguished from a true solution by

A. passing a beam of light through
B. filtering
C. crystallising
D. boiling
E. chlorinating

::A:: ::B:: ::C:: ::D:: ::E::

61 When a beam of light passes through a colloidal solution

A. the beam of light becomes darker
B. the beam becomes lighter
C. the beam is dispersed into rainbow colours
D. the beam passes through without any deflection
E. the beam is scattered

::A:: ::B:: ::C:: ::D:: ::E::

62 In milk, where colloidal globules of oil are suspended in water, a stable emulsion will not be formed unless

A. the mixture is thoroughly stirred
B. an emulsifying agent is present
C. sugar is added
D. the volume of water used is kept to the minimum
E. dilute hydrochloric acid is added

::A:: ::B:: ::C:: ::D:: ::E::

63 In making salad cream using oil and vinegar, we add ...... as an emulsifying agent.

A. water
B. milk
C. mustard
D. sugar
E. salt

::A:: ::B:: ::C:: ::D:: ::E::

64 Unless an emulsifying agent is present in an emulsion,

A. the dispersed droplets tend to separate into two layers on standing
B. the dispersed droplets and the dispersed medium will tend to become one single layer
C. the dispersed droplets will dissolve in the dispersal medium
D. the dispersed droplets will crystallise out of the solution
E. the dispersed droplets will turn into fumes

::A:: ::B:: ::C:: ::D:: ::E::

65 Choose the correct statements.

I. The particles in a colloidal solution are smaller than those in an emulsion
II. The particles in a colloidal solution are bigger than those in an emulsion
III. The particles in a colloidal solution are smaller than those in a true solution
IV. The particles in a colloidal solution are bigger than those in a true solution
V. The particles in a colloidal solution settle immediately on standing

A. I and III
B. I and IV
C. II and III
D. II and IV
E. I, IV and V

::A:: ::B:: ::C:: ::D:: ::E::

66 When a beam of light passes through common salt solution, the beam of light

A. becomes brighter
B. becomes duller
C. becomes scattered
D. passes through without any deflection
E. shows up particles in the solution

::A:: ::B:: ::C:: ::D:: ::E::

The process of digestion

67 The diagram shows the digestive system in man. Study it and then answer the questions which follow.

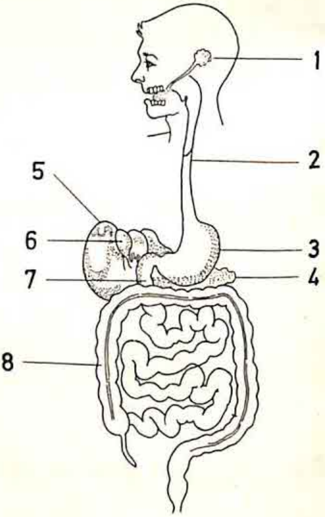

fig 5

a. The salivary gland is the part numbered

A. 1
B. 3
C. 4
D. 5
E. 6

::A:: ::B:: ::C:: ::D:: ::E::

b. The tube numbered 2 is called the

A. small intestine
B. large intestine
C. gullet
D. pancreas
E. liver

::A:: ::B:: ::C:: ::D:: ::E::

c. The stomach is the organ numbered

A. 3
B. 4
C. 5
D. 6
E. 7

::A:: ::B:: ::C:: ::D:: ::E::

d. The organ numbered 5 is called the

A. stomach
B. liver
C. gall-bladder
D. pancreas
E. large intestine

::A:: ::B:: ::C:: ::D:: ::E::

e. The organ numbered 4 is called the

A. stomach
B. liver
C. gall-bladder
D. pancreas
E. gullet

::A:: ::B:: ::C:: ::D:: ::E::

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f. Which organ stores bile?

A. 3
B. 4
C. 5
D. 6
E. 7

::A:: ::B:: ::C:: ::D:: ::E::

g. The large intestine is the part numbered

A. 2
B. 4
C. 5
D. 7
E. 8

::A:: ::B:: ::C:: ::D:: ::E::

68 For questions a, b, c and d, choose the answers from the list below.

A. salivary gland
B. cheek cells
C. stomach
D. liver
E. pancreas

a. Which part produces saliva?

::A:: ::B:: ::C:: ::D:: ::E::

b. Which part produces gastric juice?

::A:: ::B:: ::C:: ::D:: ::E::

c. Which organ makes bile?

::A:: ::B:: ::C:: ::D:: ::E::

d. Which organ produces enzymes and passes them into the small intestine?

::A:: ::B:: ::C:: ::D:: ::E::

69 What is the function of digestion?

A. to kill bacteria in the food
B. to remove the essence from the food
C. to change solid food into liquid food
D. to break up food into smaller pieces
E. to break up food into simple, soluble and diffusible substances

::A:: ::B:: ::C:: ::D:: ::E::

70 Digested food is absorbed in the

A. stomach
B. small intestine
C. large intestine
D. liver
E. pancreas

::A:: ::B:: ::C:: ::D:: ::E::

71 Water is absorbed mainly in the

A. stomach
B. small intestine
C. large intestine
D. liver
E. pancreas

::A:: ::B:: ::C:: ::D:: ::E::

72 The ...... present in digestive juices change food into simple soluble substances.

A. acids
B. alkalis
C. enzymes
D. bacteria
E. bile

::A:: ::B:: ::C:: ::D:: ::E::

73 Which statements are correct?

I. Enzymes are chemicals found in our digestive juices
II. Enzymes change food into soluble substances
III. Each enzyme acts on only one kind of food
IV. Enzymes work best at 100°C

A. I, II and III
B. I and III
C. II and IV
D. I and II
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

74 Digested food substances diffuse through the wall of the small intestine and are then carried to the cells by

A. digestive juices
B. blood
C. bile
D. enzymes
E. water

::A:: ::B:: ::C:: ::D:: ::E::

75 The digested and absorbed food substances are used for which of the following purposes?

I. for growth
II. for repairing body tissues
III. for providing energy
IV. for producing water

A. I, II and III
B. I and III
C. II and IV
D. I only
E. II only

::A:: ::B:: ::C:: ::D:: ::E::

76 A solution contains starch if it turns

A. green with iodine solution
B. dark blue with iodine solution
C. red with iodine solution
D. dark blue with Fehling's solution
E. red with Benedict's solution

::A:: ::B:: ::C:: ::D:: ::E::

77 Which of the following substances can be used to detect the presence of simple sugar in a solution?

I. iodine solution
II. copper sulphate solution
III. Fehling's solutions A and B
IV. Benedict's solution

A. I and II
B. III and IV
C. I only
D. II only
E. III only

::A:: ::B:: ::C:: ::D:: ::E::

78 You are testing a solution for simple sugar. Which of the following steps will you do?

I. add Fehling's solution to the given solution
II. add iodine solution to the given solution
III. heat the mixture
IV. cool the mixture in ice

A. I and III
B. I and IV
C. II and III
D. II and IV
E. I only

::A:: ::B:: ::C:: ::D:: ::E::

79 In question 78 what observation will indicate that the solution contains a simple sugar?

A. The solution turns cloudy
B. The solution turns black
C. The solution turns dark blue
D. The solution turns green
E. The solution turns red

::A:: ::B:: ::C:: ::D:: ::E::

80 Fehling's solution is sometimes added to urine and heated. Why is this done?

A. to detect proteins in the urine
B. to detect albumen in the urine
C. to detect oil in the urine
D. to detect sugar in the urine
E. to detect acid in the urine

::A:: ::B:: ::C:: ::D:: ::E::

81 Which test should be used and which observation should be made in order to show that pineapple juice contains a simple sugar?

	Test	*Observation*
A.	boil the juice with Fehling's solution	a reddish precipitate is formed
B.	boil the juice with iodine solution	a reddish precipitate is formed
C.	boil the juice with Fehling's solution	a blue precipitate is formed
D.	boil the juice with iodine solution	a blue precipitate is formed
E.	boil the juice with dilute acid	a brown precipitate is formed

::A:: ::B:: ::C:: ::D:: ::E::

82 What chemical effect does saliva have on a meal of rice?

A. It makes the rice easier to swallow
B. It softens the rice
C. It changes the rice to sugar
D. It kills germs in the rice
E. It has no chemical effect on the rice

::A:: ::B:: ::C:: ::D:: ::E::

83 Some starch is heated with Fehling's solution. There is no reaction.

Some starch is placed in a test tube with some saliva solution and gently heated. This sample of starch is heated with Fehling's solution. There is a positive result.

Which statement explains the positive result?

A. Saliva makes the starch ferment
B. Saliva hastens the chemical reaction
C. Saliva is alkaline
D. Saliva contains an enzyme which changes starch to a liquid
E. Saliva contains an enzyme which changes starch to sugar

::A:: ::B:: ::C:: ::D:: ::E::

84 The experiment shown in the diagram is set up. When the water in the test tube is tested at the beginning for glucose and starch, it is found to be free from them. What will you expect to find if you test the water again after ten minutes?

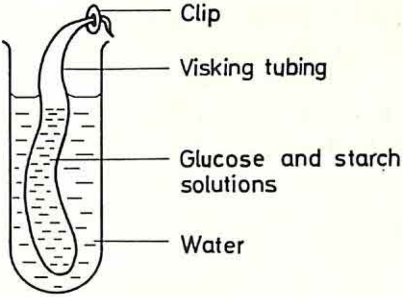


fig 6

A. glucose present in the water
B. starch present in the water
C. both glucose and starch present in the water
D. no glucose and no starch present in the water
E. two types of sugar present in the water

::A:: ::B:: ::C:: ::D:: ::E::

85 How will you explain the result in question 84?

A. moleclues of starch pass through the tubing
B. molecules of glucose pass through the tubing
C. glucose molecules and starch molecules pass through the tubing
D. glucose molecules and starch molecules cannot pass through the tubing
E. two types of sugar molecules pass through the tubing

::A:: ::B:: ::C:: ::D:: ::E::

86 The experiment is set up as shown in the diagram.

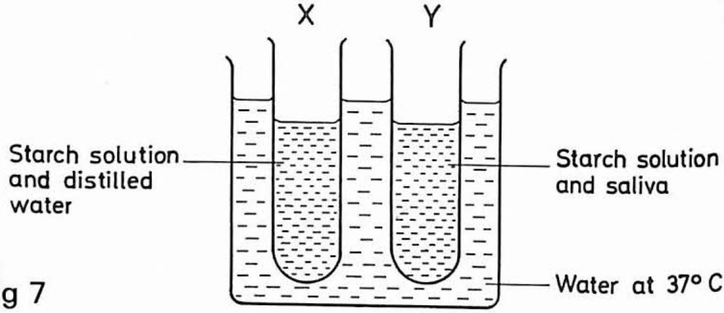

X
Y
Starch solution and distilled water
Starch solution and saliva
Water at 37° C

fig 7

After thirty minutes the liquids from each test tube are tested for starch and sugar. Which results are correct?

I. The liquid from test tube X contains starch and sugar
II. The liquid from test tube X contains starch only
III. The liquid from test tube X contains sugar only
IV. The liquid from test tube Y contains starch only
V. The liquid from test tube Y contains sugar

A. I and IV
B. I and V
C. II only
D. II and IV
E. II and V

::A:: ::B:: ::C:: ::D:: ::E::

87 In question 86, what causes the change in the experiment?

A. distilled water
B. heat
C. an enzyme
D. starch
E. an alkali

::A:: ::B:: ::C:: ::D:: ::E::

88 An enzyme works best at a temperature of about

A. 0°C
B. 37°C
C. 57°C
D. 73°C
E. 100°C

::A:: ::B:: ::C:: ::D:: ::E::

89 A test tube contains starch solution and boiled saliva solution. The test tube is put in water kept at a temperature of 37°C (body temperature). After ten minutes the liquid from the test tube is tested for starch and sugar. What results do you expect?

A. starch and sugar present
B. only sugar present
C. only starch present
D. no starch and no sugar present
E. proteins present

::A:: ::B:: ::C:: ::D:: ::E::

90 The experiment is set up and left for about thirty minutes. Which statements about the experiment are true?

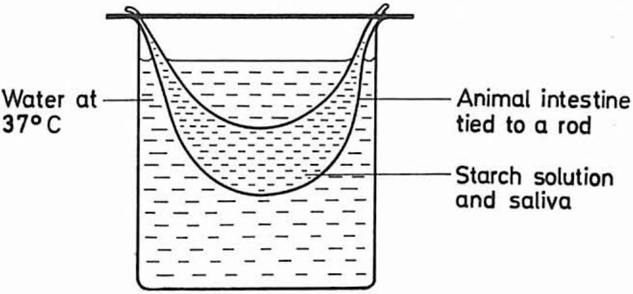


fig 8

I. At the beginning the water in the beaker does not contain sugar
II. At the end the water in the beaker contains sugar
III. The saliva changes the starch to sugar
IV. Starch solution cannot pass through the intestine

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. all

::A:: ::B:: ::C:: ::D:: ::E::

2 Some common gases

Oxygen, nitrogen and carbon dioxide

1 An acidic gas will turn bicarbonate indicator solution from deep red to

A. orange-yellow
B. blue
C. green
D. black
E. colourless

::A:: ::B:: ::C:: ::D:: ::E::

2 An alkaline gas will turn bicarbonate indicator solution from deep red to

A. orange-yellow
B. purple
C. blue
D. green
E. colourless

::A:: ::B:: ::C:: ::D:: ::E::

3 A gas which gives a pH value of less than seven is

A. caustic
B. corrosive
C. acidic
D. alkaline
E. neutral

::A:: ::B:: ::C:: ::D:: ::E::

4 A gas which gives a pH value of more than seven is

A. caustic
B. corrosive
C. acidic
D. alkaline
E. neutral

::A:: ::B:: ::C:: ::D:: ::E::

5 Which of the following can be used to find out whether a gas is acidic or alkaline?

I. moist pH paper
II. lime-water
III. bicarbonate indicator solution
IV. iodine solution

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

6 A gas which rekindles a glowing splint is

A. carbon dioxide
B. nitrogen
C. oxygen
D. hydrogen
E. helium

::A:: ::B:: ::C:: ::D:: ::E::

7 Which gas does not react with lime-water, does not affect bicarbonate indicator solution, but allows things to burn in it?

A. hydrogen
B. nitrogen
C. carbon dioxide
D. argon
E. oxygen

::A:: ::B:: ::C:: ::D:: ::E::

8 When a piece of burning magnesium ribbon is inserted in a gas jar of gas, it burns with a much brighter dazzling flame. The gas is

A. carbon dioxide
B. nitrogen
C. oxygen
D. hydrogen
E. helium

::A:: ::B:: ::C:: ::D:: ::E::

9 A boy found that a gas had the following properties:
It was colourless and insoluble in water.
It did not burn
It did not react with lime-water.
It did not affect bicarbonate indicator solution.
What was the gas?

A. carbon dioxide
B. nitrogen
C. oxygen
D. hydrogen
E. tests are not conclusive enough

::A:: ::B:: ::C:: ::D:: ::E::

10 Name a gas which does not burn, does not support combustion, and is neither acidic nor alkaline.

A. carbon dioxide
B. oxygen
C. hydrogen
D. nitrogen
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

11 One slightly acidic gas is

A. carbon dioxide
B. nitrogen
C. oxygen
D. hydrogen
E. helium

::A:: ::B:: ::C:: ::D:: ::E::

12 A gas is neutral when it is tested with moist pH paper and it does not react with lime-water. The gas cannot be

A. helium
B. hydrogen
C. oxygen
D. nitrogen
E. carbon dioxide

::A:: ::B:: ::C:: ::D:: ::E::

13 When burning magnesium ribbon is inserted in a gas jar of gas, it burns with a crackling sound and leaves behind black dots on the side of the jar. What is the gas in the jar?

A. nitrogen
B. oxygen
C. carbon dioxide
D. hydrogen
E. argon

::A:: ::B:: ::C:: ::D:: ::E::

14 When a gas is bubbled through clear lime-water, a white precipitate is formed. The gas is assumed to be carbon dioxide because

A. it is the only gas that forms a white precipitate with lime-water
B. it only reacts with lime-water
C. it is an acidic gas
D. there is no change in temperature
E. there is no change in weight

::A:: ::B:: ::C:: ::D:: ::E::

15 A gas jar of carbon dioxide is poured into another gas jar which has a candle burning in it.

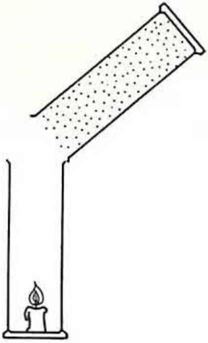


fig 9

This experiment will demonstrate that

A. carbon dioxide burns quietly
B. carbon dioxide does not burn brightly
C. carbon dioxide allows things to burn in it
D. carbon dioxide is a light gas
E. carbon dioxide is a heavy gas and does not support combustion

A B C D E

16 Two empty beakers are balanced on a chemical balance. A beaker of carbon dioxide is poured into one beaker.
This experiment will demonstrate that

A. carbon dioxide is lighter than air
B. carbon dioxide is heavier than air
C. carbon dioxide is a gas
D. carbon dioxide can be collected by upward displacement of air
E. carbon dioxide occupies space

A B C D E

17 What gases are usually collected in the laboratory by the method shown in the diagram below?

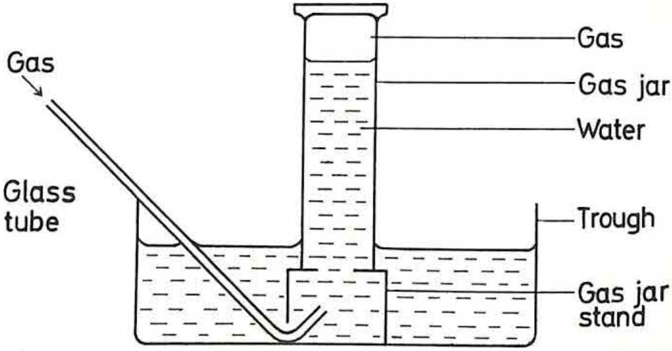


fig 10

I. carbon dioxide
II. nitrogen
III. nitrogen dioxide
IV. oxygen

A. I, II and III
B. I and III
C. II and IV
D. II only
E. IV only

::A:: ::B:: ::C:: ::D:: ::E::

18 We usually do not collect carbon dioxide by the method shown in the diagram in question 17 because

A. carbon dioxide contains more than one element
B. carbon dioxide is a colourless gas
C. carbon dioxide is a heavy gas
D. carbon dioxide becomes wet
E. carbon dioxide dissolves in water

::A:: ::B:: ::C:: ::D:: ::E::

Energy intake and photosynthesis

19 Which process uses up carbon dioxide and sets free oxygen?

A. condensation
B. evaporation
C. transpiration
D. photosynthesis
E. respiration

::A:: ::B:: ::C:: ::D:: ::E::

20 Which process uses up oxygen and sets free carbon dioxide?

A. condensation
B. evaporation
C. transpiration
D. photosynthesis
E. respiration

::A:: ::B:: ::C:: ::D:: ::E::

21 What process does the equation represent?

Water + carbon dioxide $\xrightarrow[\text{chlorophyll}]{\text{sunlight}}$ sugar + oxygen

A. photosynthesis
B. respiration
C. osmosis
D. transpiration
E. digestion

::A:: ::B:: ::C:: ::D:: ::E::

22 Green leaves are important to plants because

A. they contain stomata
B. they contain cells
C. they take in air
D. they make starch
E. they give out water vapour

::A:: ::B:: ::C:: ::D:: ::E::

23 The food made in green leaves during photosynthesis travels to other parts of the plant in the form of

A. sugar crystals
B. sugar solution
C. starch powder
D. starch solution
E. starch paste

::A:: ::B:: ::C:: ::D:: ::E::

24 During photosynthesis green plants use carbon dioxide and water. The products from this process are then changed back to carbon dioxide and water in our body.
What energy change takes place?

A. heat → chemical → electrical
B. heat → chemical → kinetic
C. light → chemical → heat
D. light → heat → chemical
E. potential → chemical → heat

::A:: ::B:: ::C:: ::D:: ::E::

25 When we test a green leaf for starch, we put the leaf in boiling water. This is done to

A. kill the germs
B. wash the leaf
C. remove starch
D. remove sugar
E. kill the chloroplasts

::A:: ::B:: ::C:: ::D:: ::E::

26 In testing a green leaf for starch, we boil the leaf in alcohol. This is done to

A. kill the bacteria
B. harden the leaf
C. extract the starch
D. remove the chlorophyll
E. dissolve the sugar

::A:: ::B:: ::C:: ::D:: ::E::

27 The following steps should be done, but not in the order given, when we test a leaf for starch. Choose the correct order.

I. add iodine solution to the leaf
II. boil the leaf in alcohol
III. boil the leaf in water
IV. wash the leaf in water

A. III, II, IV, I
B. IV, III, I, II
C. II, III, IV, I
D. II, IV, III, I
E. IV, II, III, I

::A:: ::B:: ::C:: ::D:: ::E::

28 Photosynethesis is important to us because

A. it removes carbon dioxide and sets free oxygen
B. it requires sunlight
C. it requires chlorophyll
D. it uses water
E. it stops at night

::A:: ::B:: ::C:: ::D:: ::E::

29 Under what conditions will green plants make starch?

I. chlorophyll must be present
II. sunlight must be present
III. carbon dioxide must be present
IV. water must be present

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

30 During photosynthesis chlorophyll is necessary for absorbing

A. water
B. light
C. carbon dioxide
D. oxygen
E. starch

::A:: ::B:: ::C:: ::D:: ::E::

31 Which part indicated in the diagram of a plant cell makes chlorophyll?

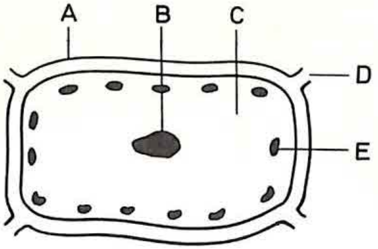


fig 11

::A:: ::B:: ::C:: ::D:: ::E::

32 The diagram shows a cross-section of a leaf.

a. Which lettered part is a stoma?

::A:: ::B:: ::C:: ::D:: ::E::

b. Which lettered part indicates an air space?

::A:: ::B:: ::C:: ::D:: ::E::

c. Which lettered part indicates a guard-cell?

::A:: ::B:: ::C:: ::D:: ::E::

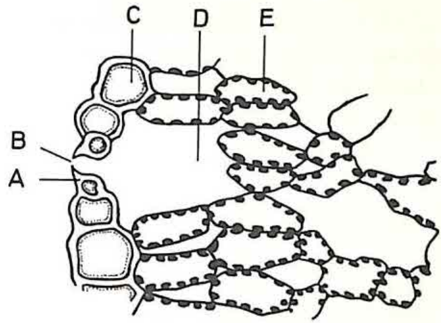


fig 12

d. What is the function of a stoma?

A. to allow air and water vapour to pass through
B. to filter air passing through
C. to absorb carbon dioxide passing through
D. to set free energy
E. to give out sugar solution

::A:: ::B:: ::C:: ::D:: ::E::

e. What is the function of guard-cells?

A. to absorb light
B. to absorb carbon dioxide
C. to control the size of the stoma
D. to make starch
E. to change starch to sugar solution

::A:: ::B:: ::C:: ::D:: ::E::

33 The experiment shown below is set up. What will it demonstrate?

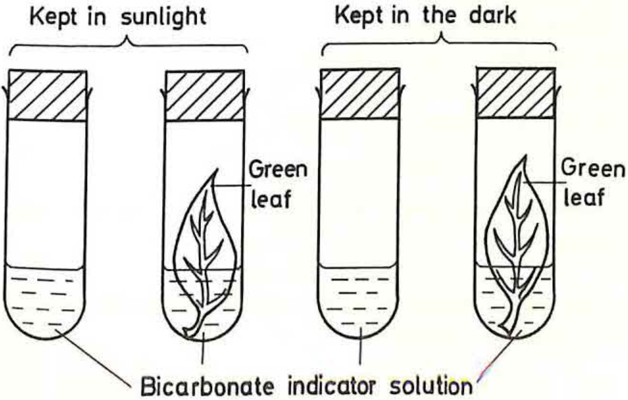


fig 13

I. Green leaves set free carbon dioxide in sunlight
II. Green leaves use up carbon dioxide in sunlight
III. Green leaves set free carbon dioxide in the dark
IV. Green leaves use up carbon dioxide in the dark

A. III only
B. II only
C. I and IV
D. II and III
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

34 A pot of green plant is kept in the dark for three days in order to destarch the leaves. Then the experiment shown below is set up, and placed in bright sunlight for a few hours.

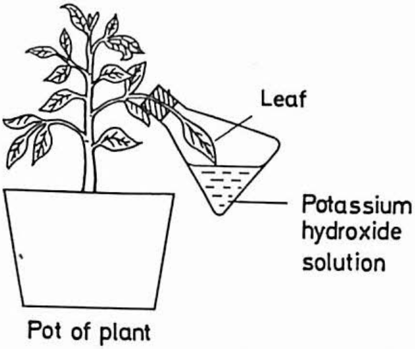


fig 14

a. What is the use of the potassium hydroxide solution?

A. to absorb water
B. to absorb oxygen
C. to absorb carbon dioxide
D. to absorb light energy
E. to supply chemical energy

::A:: ::B:: ::C:: ::D:: ::E::

b. Which statement about the leaf in the flask is correct?

A. The leaf does not contain starch because it does not get carbon dioxide

B. The leaf does not contain starch because it does not get oxygen

C. The leaf does not contain starch because it does not get water vapour
D. The leaf contains starch because it receives sunlight
E. The leaf contains starch because it gets water and oxygen

::A:: ::B:: ::C:: ::D:: ::E::

c. Which statement about the leaves outside the flask is correct?

A. The leaves make starch because they get water
B. The leaves make starch because they get carbon dioxide
C. The leaves make starch because they get sunlight
D. The leaves make starch because they get chlorophyll
E. The leaves make starch because they get water, carbon carbon, sunlight and chlorophyll

::A:: ::B:: ::C:: ::D:: ::E::

35 The experiment is set up, using destarched green leaves. At the end of the experiment the leaves are tested for starch.
What will the experiment demonstrate?

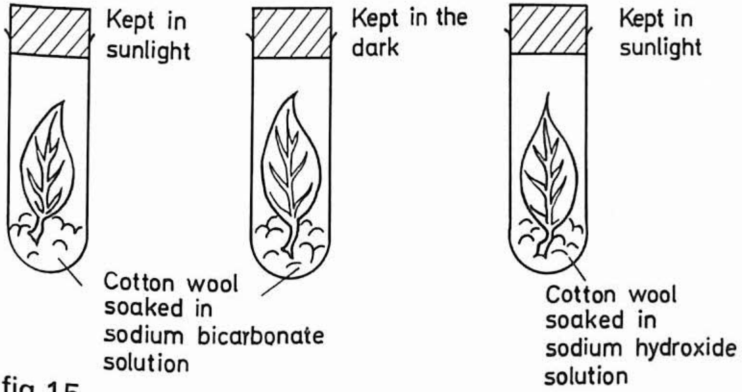

Kept in sunlight
Kept in the dark
Kept in sunlight
Cotton wool soaked in sodium bicarbonate solution
Cotton wool soaked in sodium hydroxide solution

fig 15

A. carbon dioxide is necessary to make starch
B. light is necessary to make starch
C. water is necessary to make starch
D. leaf green is necessary to make starch
E. carbon dioxide and light are necessary to make starch

::A:: ::B:: ::C:: ::D:: ::E::

36 Given a variegated leaf.
Some parts of the leaf are white because

A. those parts do not get carbon dioxide
B. those parts do not get oxygen
C. those parts do not get water
D. those parts do not get chlorophyll
E. those parts do not get sunlight

::A:: ::B:: ::C:: ::D:: ::E::

37 A potted plant with variegated leaves is watered and kept in sunlight for many hours. Then a leaf from the plant is plucked and tested for starch. It is found that some parts of the leaf contain starch, while other parts do not.
This experiment is used to demonstrate that

A. starch is formed in sunlight
B. starch is not formed in sunlight
C. starch is not formed when there is too much water
D. only the green parts of a leaf form starch
E. carbon dioxide is necessary for starch to form

::A:: ::B:: ::C:: ::D:: ::E::

38 A pot of green plant is kept in the dark for three days in order to destarch the leaves. Then a leaf which is still attached to the plant is sandwiched between two pieces of cardboard. After the plant has been placed in sunlight for several hours, the leaf is plucked and tested for starch. Which statement about the leaf is correct?

A. The leaf contains starch because the plant gets sunlight
B. The leaf contains starch because the plant gets water and carbon dioxide
C. The leaf does not contain starch because it does not get sunlight
D. The leaf does not contain starch because it does not get carbon dioxide
E. The leaf does not contain starch because it does not get water

::A:: ::B:: ::C:: ::D:: ::E::

39 In an experiment to show that light is necessary for plants to make starch the following steps, but not in the order given, are taken. Choose the correct order of steps.

I. Some leaves are covered with an opaque material
II. The pot of plant is kept in the dark for a few days to destarch the leaves
III. The pot of plant is kept in bright sunlight for some hours
IV. Some covered leaves and some uncovered leaves are plucked and tested for starch

A. I, II, III, IV
B. II, I, III, IV
C. II, III, IV, I
D. II, III, I, IV
E. II, I, IV, III

::A:: ::B:: ::C:: ::D:: ::E::

40 A plant is kept in the dark for a few days so that the leaves are destarched. Two leaves from the plant are then plucked. One leaf is floated right side up in a five percent glucose solution. The second leaf is similarly floated in water. The leaves are kept in the dark for a few days. Then they are tested for starch.

a. This experiment will demonstrate that

A. green leaves make starch from water
B. green leaves make starch from glucose
C. green leaves do not make starch from glucose
D. green leaves do not make starch in the dark
E. green leaves cannot make starch from glucose and water only

::A:: ::B:: ::C:: ::D:: ::E::

b. Why must the leaves be kept in the dark after they have been floated in the liquids?

A. to stop photosynthesis
B. to stop respiration

C. to stop the starch in the leaves from changing into sugar
D. to decolourise the leaves
E. to kill the cells in the leaves

::A:: ::B:: ::C:: ::D:: ::E::

41 Study the experiment shown.

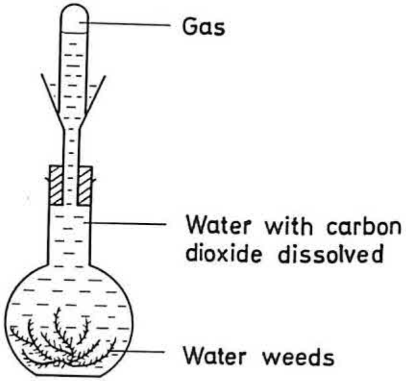


fig 16

a. The experiment is set up in bright sunlight to demonstrate that

A. water contains carbon dioxide
B. water contains oxygen
C. water contains air
D. water plants set free oxygen in sunlight
E. water plants set free carbon dioxide in sunlight

::A:: ::B:: ::C:: ::D:: ::E::

b. What would you use to test the gas collected in the test tube?

A. moist litmus paper
B. moist pH paper
C. a glowing splint
D. lime-water
E. bicarbonate indicator solution

::A:: ::B:: ::C:: ::D:: ::E::

Unbreathed and breathed air

42 Breathed air contains more ...... than unbreathed air.

A. carbon dioxide
B. oxygen
C. nitrogen
D. hydrogen
E. nitrogen dioxide

::A:: ::B:: ::C:: ::D:: ::E::

43 Breathed air contains less ...... than unbreathed air.

A. carbon dioxide
B. oxygen
C. nitrogen
D. hydrogen
E. nitrogen dioxide

::A:: ::B:: ::C:: ::D:: ::E::

44 Unbreathed air does not turn lime-water chalky because

A. it does not contain water vapour
B. it does not contain enough carbon dioxide
C. it does not contain enough oxygen
D. it does not contain enough nitrogen
E. it is not warm

::A:: ::B:: ::C:: ::D:: ::E::

45 Breathed air is more acidic than unbreathed air because

A. it contains more oxygen
B. it contains more nitrogen
C. it contains more carbon dioxide
D. it contains more hydrogen
E. it contains more water vapour

::A:: ::B:: ::C:: ::D:: ::E::

46 Which of these statements are true for exhaled air?

I. It is warmer than inhaled air
II. It is damper than inhaled air
III. It contains more carbon dioxide than inhaled air
IV. It contains less nitrogen than inhaled air

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

:A: :B: :C: :D: :E:

47 The experiment shown below is set up.

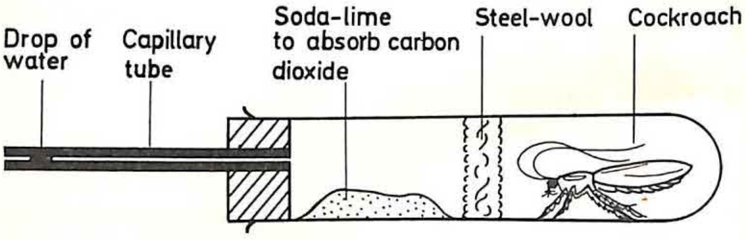


fig 17

During the experiment it is observed that the drop of water gradually moves towards the test tube. Why does this happen?

A. because the soda lime absorbs carbon dioxide
B. because the soda lime absorbs water
C. because the cockroach uses up carbon dioxide
D. because the cockroach uses up nitrogen
E. because the cockroach uses up oxygen

:A: :B: :C: :D: :E:

48 Study the diagram.

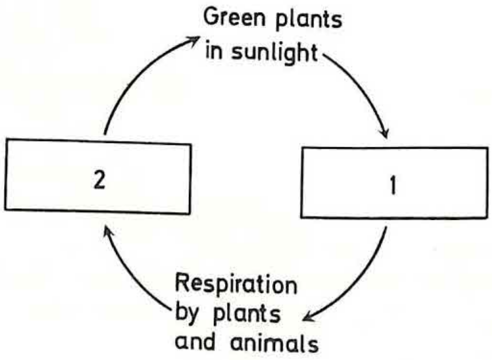


fig 18

a. The correct word for box 1 is

A. oxygen
B. carbon dioxide
C. nitrogen
D. hydrogen
E. water

::A:: ::B:: ::C:: ::D:: ::E::

b. The correct item for box 2 is

A. oxygen
B. carbon dioxide
C. nitrogen
D. hydrogen
E. water

::A:: ::B:: ::C:: ::D:: ::E::

49 Carbon + gas X → carbon dioxide
What is gas X?

A. carbon dioxide
B. nitrogen
C. oxygen
D. hydrogen
E. water vapour

::A:: ::B:: ::C:: ::D:: ::E::

50 What gas is produced when a piece of bread is burnt in air?

A. carbon dioxide
B. sulphur dioxide
C. nitrogen dioxide
D. oxygen
E. nitrogen

::A:: ::B:: ::C:: ::D:: ::E::

51 When cornflakes, starch and sugar are burnt in air, carbon dioxide is produced. This shows that the three substances contain

A. oxygen
B. nitrogen
C. carbon
D. sulphur
E. gases

::A:: ::B:: ::C:: ::D:: ::E::

52 Breathed air contains more carbon dioxide than unbreathed air. The extra carbon dioxide comes mainly from

A. absorption of digested food
B. digestion of food
C. decay of body tissues
D. photosynthesis in the cells
E. respiration in the cells

::A:: ::B:: ::C:: ::D:: ::E::

Composition of air

53 About how many percent of the air is carbon dioxide?

A. 0·03%
B. 0·05%
C. 10%
D. 21%
E. 78%

::A:: ::B:: ::C:: ::D:: ::E::

54 Which gas forms nearly eighty percent of the air?

A. carbon dioxide
B. oxygen
C. nitrogen
D. hydrogen
E. helium

::A:: ::B:: ::C:: ::D:: ::E::

55 About one-fifth of the air is

A. carbon dioxide
B. oxygen
C. nitrogen
D. hydrogen
E. helium

::A:: ::B:: ::C:: ::D:: ::E::

56 Which are the noble gases?

I. argon
II. xenon
III. krypton
IV. helium
V. neon

A. I, II and III
B. II, III and IV
C. I and III
D. II and IV
E. all

::A:: ::B:: ::C:: ::D:: ::E::

57 Which is the lightest gas in the group below?

A. krypton
B. argon
C. neon
D. helium
E. xenon

::A:: ::B:: ::C:: ::D:: ::E::

58 A dry gas jar is inverted over a burning candle as shown in the diagram. After some time the candle goes out.

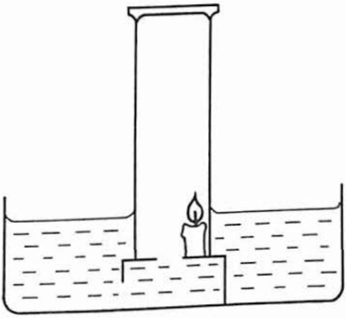


fig 19

a. How high does water rise in the gas jar?

A. about quarter way up
B. about half way up
C. about one-fifth way up
D. almost to the top
E. water does not rise in the jar

::A:: ::B:: ::C:: ::D:: ::E::

b. What does this experiment demonstrate?

A. water is used up during burning
B. carbon dioxide is used up during burning
C. carbon dioxide is set free during burning
D. oxygen is used up during burning
E. nitrogen is used up during burning

::A:: ::B:: ::C:: ::D:: ::E::

c. What is the main gas left in the jar after burning?

A. carbon dioxide
B. nitrogen
C. oxygen
D. hydrogen
E. argon

::A:: ::B:: ::C:: ::D:: ::E::

59 The apparatus shown below is set up. The space above the water level in the jar is 1,000 ml. The space contains nitrogen, carbon dioxide and oxygen in the ratio of 2:1:1. After the phosphorus has completely reacted, how much space is left in the jar?

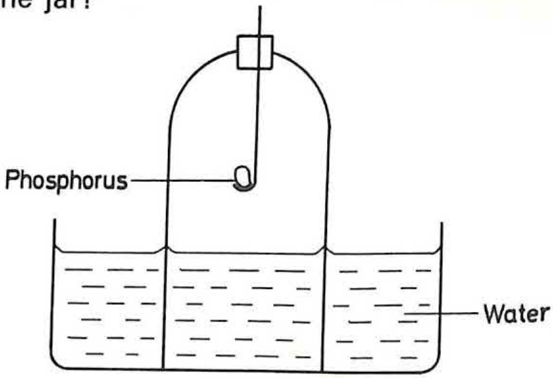


fig 20

A. 100 ml
B. 250 ml
C. 500 ml
D. 750 ml
E. 1,000 ml

::A:: ::B:: ::C:: ::D:: ::E::

60 What is substance X in the equation below?

Oxygen + substance X → magnesium oxide

A. magnesium
B. magnesium chloride
C. magnesium nitrate
D. magnesium hydroxide
E. magnesium sulphate

::A:: ::B:: ::C:: ::D:: ::E::

61 A piece of magnesium is burnt in air. The ash obtained is heavier than the piece of magnesium. Why is this so?

A. The magnesium has absorbed water vapour
B. The magnesium has gained energy
C. The magnesium has combined with carbon dioxide
D. The magnesium has combined with hydrogen
E. The magnesium has combined with oxygen

::A:: ::B:: ::C:: ::D:: ::E::

62 A piece of magnesium ribbon is placed in a crucible and is covered with fine sand. The crucible is strongly heated. But the magnesium does not burn!
Why does it not burn?

A. The magnesium does not get oxygen
B. The magnesium does not get direct heat
C. The magnesium reacts with the sand
D. The magnesium has not been sand-papered
E. Magnesium does not burn

::A:: ::B:: ::C:: ::D:: ::E::

63 Which statements are true?

I. Combustion does not use up all the air
II. About four-fifths of the air allows things to burn in it
III. There is an increase in weight when a thing is burnt in air
IV. The noble gases form about one-fifth of the air

A. I, II and III
B. I and III
C. II and IV
D. I only
E. III only

::A:: ::B:: ::C:: ::D:: ::E::

64 Which use is not true of oxygen?

A. Oxygen is used in the oxy-acetylene flame
B. Oxygen is used by mountain climbers and sea divers
C. Oxygen is used in space rockets as fuels
D. Oxygen is used in the manufacture of steel
E. Oxygen is used in fire extinguishers

::A:: ::B:: ::C:: ::D:: ::E::

65 For which of the following reasons is carbon dioxide used in some fire extinguishers?

I. It does not burn
II. It does not allow things to burn in it
III. It is heavier than air
IV. It is a gas

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

66 When dough is baked it rises because

A. oxygen is set free
B. oxygen is combined with the dough
C. carbon dioxide is set free
D. carbon dioxide is absorbed
E. water is absorbed

::A:: ::B:: ::C:: ::D:: ::E::

67 When a bottle of fizzy drink is opened, bubbles of carbon dioxide are set free. This is because

A. fermentation starts immediately
B. carbon dioxide is less soluble at low pressure
C. carbon dioxide is less soluble at high pressure
D. carbon dioxide does not dissolve in water
E. carbon dioxide is a light gas

::A:: ::B:: ::C:: ::D:: ::E::

68 When some health salts are added to water, a gas is quickly produced. What gas is this?

A. oxygen
B. nitrogen
C. carbon dioxide
D. neon
E. xenon

::A:: ::B:: ::C:: ::D:: ::E::

69 Which statement is incorrect?

A. Fruits keep better in air which has more carbon dioxide and less oxygen
B. Carbon dioxide is used in making washing soda and baking soda
C. Under great pressure carbon dioxide can be turned into a solid
D. Carbon dioxide is used in aerated water
E. Carbon dioxide is a poisonous gas

::A:: ::B:: ::C:: ::D:: ::E::

70 Dry ice or solid carbon dioxide is better than ordinary ice for which of the following reasons?

I. It is cheaper
II. It is much colder
III. It is easier to make
IV. It changes directly into gas

A. I, II and III
B. I and III
C. II and IV
D. I and II
E. III and IV

::A:: ::B:: ::C:: ::D:: ::E::

71 For questions a, b, c, d and e, choose the answers from the list below.

A. xenon
B. neon
C. helium
D. argon
E. krypton

a. Which gas is used in filament bulbs?

::A:: ::B:: ::C:: ::D:: ::E::

b. Which gas is used in electric signs that give an orange-red light?

::A:: ::B:: ::C:: ::D:: ::E::

c. Which gas is used in filling weather balloons?

::A:: ::B:: ::C:: ::D:: ::E::

d. Which gas is used in electric bulbs to give a green light?

::A:: ::B:: ::C:: ::D:: ::E::

e. Which gas can be used as an anaesthetic?

::A:: ::B:: ::C:: ::D:: ::E::

72 Oxygen can be obtained industrially from air by

A. the chemical action of manganese dioxide and hydrogen peroxide
B. heating potassium chlorate
C. dissolving air in water and then boiling the water
D. fractional distillation
E. using a chemical to absorb oxygen from the air

::A:: ::B:: ::C:: ::D:: ::E::

73 The apparatus is set up and the flask of water is boiled. What is the aim of the experiment?

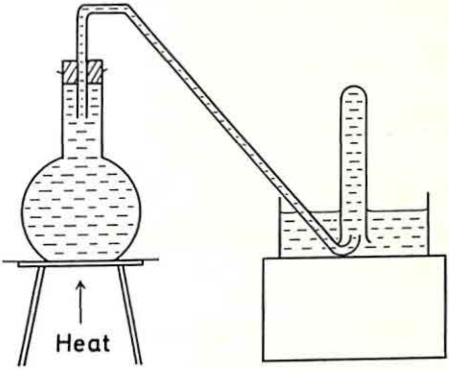


fig 21

A. to collect steam
B. to collect the air dissolved in the water
C. to collect the chlorine gas dissolved in the water
D. to kill bacteria in the water
E. to show that water expands on heating

::A:: ::B:: ::C:: ::D:: ::E::

74 Living things in water can survive because

A. they can get food
B. they can get air
C. they can get food and air
D. they can get carbon dioxide
E. they have the will to live

::A:: ::B:: ::C:: ::D:: ::E::

Respiration

75 What process does the equation represent?

Sugar + oxygen → energy + water + carbon dioxide

A. photosynthesis
B. respiration
C. osmosis
D. transpiration
E. digestion

::A:: ::B:: ::C:: ::D:: ::E::

76 What gas does our body cells use during respiration?

A. carbon dioxide
B. nitrogen
C. oxygen
D. hydrogen
E. argon

::A:: ::B:: ::C:: ::D:: ::E::

77 What are the waste products set free during respiration?

A. energy, carbon dioxide and water
B. energy and carbon dioxide
C. carbon dioxide and water
D. energy and water
E. carbon dioxide only

::A:: ::B:: ::C:: ::D:: ::E::

78 What is the most important result of respiration in a living organism?

A. oxygen is used up
B. water is set free
C. carbon dioxide is set free
D. energy is set free
E. starch is changed into sugar

::A:: ::B:: ::C:: ::D:: ::E::

79 For what purpose is the energy set free during respiration used by an animal?

I. to keep it warm
II. to make it grow
III. to enable it to move
IV. to make the bones strong

A. I, II and III
B. I and III
C. II and IV
D. I only
E. III only

::A:: ::B:: ::C:: ::D:: ::E::

80 Which statements are true?

I. Living plants and animals get energy by breaking down food substances in the cells
II. The complete breaking down of food substances in the cells requires oxygen
III. The process of respiration is exactly opposite to that of burning
IV. The process of respiration in animals is similar to the process of photosynthesis in plants

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

81 To find out whether a person is dead or alive, we sometimes hold a mirror in front of his nose.

Why do we do this?

A. A living person breathes out water vapour
B. A living person breathes out carbon dioxide
C. A living person uses up oxygen
D. A living person needs air
E. A living person responds to light reflected by the mirror

::A:: ::B:: ::C:: ::D:: ::E::

82 The diagram illustrates an experiment on respiration by a living toad.

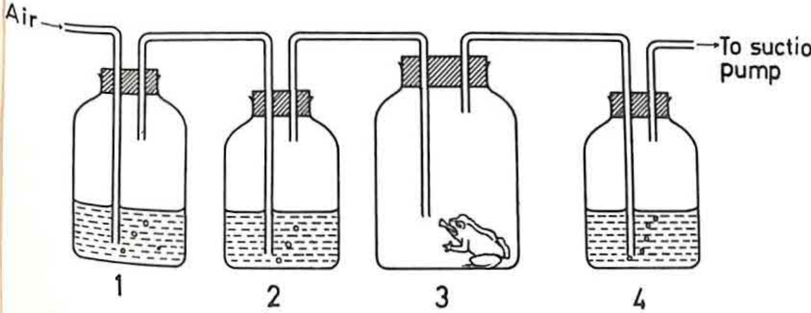


fig 22

a. The solution in flask 1 is

A. sodium hydroxide
B. sodium carbonate
C. lime-water
D. water
E. dilute sulphuric acid

::A:: ::B:: ::C:: ::D:: ::E::

b. The solution in flask 1 is used to

A. absorb oxygen
B. absorb carbon dioxide
C. absorb water vapour
D. make the air alkaline
E. make the air acidic

::A:: ::B:: ::C:: ::D:: ::E::

c. What gas is set free by the toad?

A. hydrogen
B. helium
C. oxygen
D. carbon dioxide
E. helium

::A:: ::B:: ::C:: ::D:: ::E::

d. The solution in flask 2 does not turn chalky because

A. the air passing through it is acidic
B. the air passing through it is alkaline
C. the air passing through it has no water vapour
D. the air passing through it has no oxygen
E. the air passing through it has no carbon dioxide

::A:: ::B:: ::C:: ::D:: ::E::

e. The solution in flask 4 turns chalky because

A. the air passing through it is acidic
B. the air passing through it is alkaline
C. the air passing through it contains water vapour
D. the air passing through it contains more oxygen
E. the air passing through it contains more carbon dioxide

::A:: ::B:: ::C:: ::D:: ::E::

f. If instead of a toad, fresh leafy green shoots are used in the experiment, what precaution should be taken?

A. The solutions must be warm
B. The green shoots must be destarched
C. The experiment should be placed in bright sunlight
D. The experiment should be placed in the dark
E. No air should be drawn through the apparatus

::A:: ::B:: ::C:: ::D:: ::E::

83 The table below compares respiration with photosynthesis. Which comparison is incorrect?

	Respiration	*Photosynthesis*
A.	breaks down food	builds up food
B.	sets free energy	stores energy
C.	gives out carbon dioxide	gives out oxygen
D.	takes place in all living plant cells and animal cells	takes place in cells where there is chlorophyll
E.	goes on in the dark only	goes on in the light only

::A:: ::B:: ::C:: ::D:: ::E::

The respiratory system

84 Study the diagram and then answer the questions which follow.

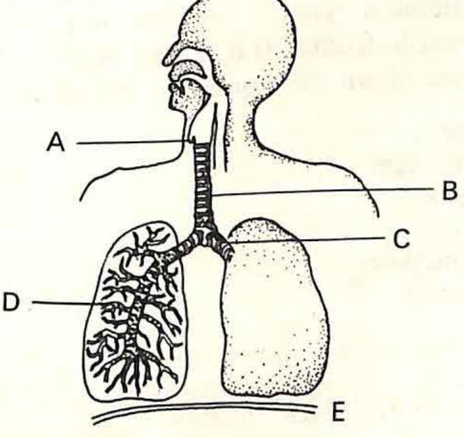


fig 23

a. Which letter indicates the voice box?

::A:: ::B:: ::C:: ::D:: ::E::

b. Which letter indicates the windpipe?

::A:: ::B:: ::C:: ::D:: ::E::

c. Which letter indicates a bronchus?

::A:: ::B:: ::C:: ::D:: ::E::

d. Which letter indicates a bronchiole?

::A:: ::B:: ::C:: ::D:: ::E::

e. Which letter indicates the diaphragm?

::A:: ::B:: ::C:: ::D:: ::E::

85 For questions a, b and c, choose the answers from the list below.

A. larynx
B. bronchus
C. bronchiole
D. trachea
E. alveoli

a. What is another name for the voice box?

::A:: ::B:: ::C:: ::D:: ::E::

b. What is another name for the windpipe?

::A:: ::B:: ::C:: ::D:: ::E::

c. What is another name for the air sacs?

::A:: ::B:: ::C:: ::D:: ::E::

86 The questions below consist of five lettered headings followed by five statements. For each statement, select the heading which is most suitable to match it. Each heading may be used once, more than once, or not at all.

Headings

A. diaphragm
B. larynx
C. air sac
D. bronchiole
E. trachea

Statements

a. This is a sheet of muscle

::A:: ::B:: ::C:: ::D:: ::E::

b. It is commonly called the Adam's apple

::A:: ::B:: ::C:: ::D:: ::E::

c. It is a large non-collapsible tube

::A:: ::B:: ::C:: ::D:: ::E::

d. It is a small air tube in a lung

::A:: ::B:: ::C:: ::D:: ::E::

e. It separates the chest from the abdomen

::A:: ::B:: ::C:: ::D:: ::E::

87 What happens to the air when it enters the lungs?

I. It is warmed
II. It is filtered
III. It is moistened
IV. Any bacteria in it is killed

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

88 The actual exchange of gases takes place in the

A. larynx
B. trachea
C. air sacs
D. bronchi
E. bronchioles

::A:: ::B:: ::C:: ::D:: ::E::

89 Which item below has moist, thin walls covered with small blood capillaries?

A. diaphragm
B. bronchiole
C. bronchus
D. air sac
E. trachea

::A:: ::B:: ::C:: ::D:: ::E::

90 Which item below correctly shows the passage of air from the time it is breathed in until it reaches the blood vessels in the lungs?

A. trachea → bronchioles → bronchi → air sacs
B. trachea → bronchi → bronchioles → air sacs

C. trachea → bronchi → air sacs → bronchioles
D. bronchi → bronchioles → air sacs → trachea
E. bronchioles → bronchi → trachea → air sacs

::A:: ::B:: ::C:: ::D:: ::E::

91 A boy describes what happens when he breathes in air.
Which description is incorrect?

A. The muscles of the ribs contract
B. The ribs are raised and the breast-bone goes forwards
C. The diaphragm is lowered and flattened
D. The chest contracts
E. The pressure in the chest decreases and air enters the lungs

::A:: ::B:: ::C:: ::D:: ::E::

92 A boy describes what happens when he breathes out air.
Which description is incorrect?

A. The muscles of the ribs relax
B. The ribs are lowered and the breast-bone moves inwards
C. The diaphragm relaxes and curves upwards
D. The chest contracts
E. The pressure in the chest decreases and air is forced out of the lungs

::A:: ::B:: ::C:: ::D:: ::E::

3 Making heat flow

Methods of heat transfer

1 Which processes transfer heat energy from one place to another?

I. conduction
II. radiation
III. convection
IV. reduction

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

2 For questions a, b and c, choose the answers from the list below.

A. conduction
B. radiation
C. reflection
D. absorption
E. convection

a. A bar of metal is heated at one end. The other end soon becomes hot. By which process has heat travelled along the bar of metal?

::A:: ::B:: ::C:: ::D:: ::E::

b. A beaker of water is heated. Soon the water at the top is warm. By which process has heat travelled to the top of the beaker?

::A:: ::B:: ::C:: ::D:: ::E::

c. You place your hand below a hot electric iron. You feel the heat from the iron. By which process has heat reached your hand?

::A:: ::B:: ::C:: ::D:: ::E::

3 The process by which heat is transferred by the circulation of particles which carry heat is called

A. conduction
B. reflection
C. absorption
D. convection
E. radiation

::A:: ::B:: ::C:: ::D:: ::E::

4 Which statement about conduction is incorrect?

A. During conduction in a solid the molecules vibrate
B. The vibrating molecules move along the solid
C. The vibration is transferred from molecule to molecule
D. Heat energy is transferred from molecule to molecule
E. Heat energy makes the molecules vibrate

::A:: ::B:: ::C:: ::D:: ::E::

5 For questions a, b and c, choose the correct terms from the list below to match the statements.

A. radiation
B. reflection
C. convection
D. conduction
E. respiration

a. It is the transfer of heat from one place to another by heat rays, without the use of any material.

::A:: ::B:: ::C:: ::D:: ::E::

b. It is the transfer of heat through a body from one stationary heated particle to the next one.

::A:: ::B:: ::C:: ::D:: ::E::

c. It is the transfer of heat from one place to another by the heated particles moving away.

::A:: ::B:: ::C:: ::D:: ::E::

6 The questions below consist of five lettered headings followed by six statements. For each statement, select the heading which is most suitable to match it. Each heading may be used once, more than once, or not at all.

Headings

A. conduction
B. convection
C. radiation
D. respiration
E. photosynthesis

Statements

a. During this process heat energy is carried by molecules moving.

::A:: ::B:: ::C:: ::D:: ::E::

b. During this process heat energy is passed along by molecules vibrating.

::A:: ::B:: ::C:: ::D:: ::E::

c. During this process heat energy is sent out without the help of molecules.

::A:: ::B:: ::C:: ::D:: ::E::

d. This process can take place in a vacuum.

::A:: ::B:: ::C:: ::D:: ::E::

e. This process takes place mainly in solids.

::A:: ::B:: ::C:: ::D:: ::E::

f. This process sets up a current.

::A:: ::B:: ::C:: ::D:: ::E::

7 Study the diagram and then answer the questions which follow.

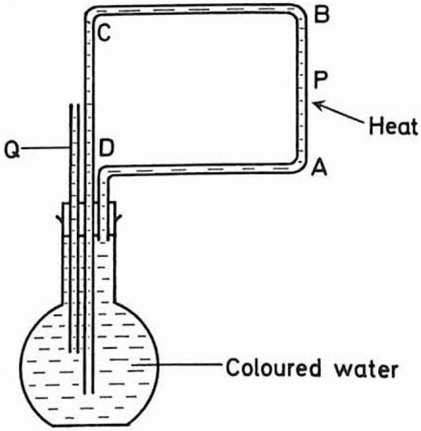


fig 24

a. When the tube is heated at P, the coloured water is seen to move in the direction ABCD. The water moves in that direction because

A. the water molecules become heavier
B. the water molecules gain energy
C. the water molecules become smaller
D. the water molecules attract each other
E. the water molecules change their shape

::A:: ::B:: ::C:: ::D:: ::E::

b. What is the use of the tube Q?

A. It makes the water circulate
B. It conducts away extra heat energy
C. It lowers the boiling point of the water
D. It removes heat energy from the water
E. It acts as a safety tube for the water to escape

::A:: ::B:: ::C:: ::D:: ::E::

Problem situations

8 Name the best conductor of heat in the group.

A. water
B. air
C. glass
D. rubber
E. mercury

::A:: ::B:: ::C:: ::D:: ::E::

9 Name the worst conductor of heat in the group.

A. water
B. air
C. iron
D. plastic
E. stone

::A:: ::B:: ::C:: ::D:: ::E::

10 You are given a brass rod, a copper rod, a glass rod and a wooden rod. Make a list of the things in order, starting with the best conductor.

A. brass, copper, glass, wood
B. copper, brass, glass, wood
C. copper, brass, wood, glass
D. wood, glass, brass, copper
E. glass, wood, copper, brass

::A:: ::B:: ::C:: ::D:: ::E::

11 Pipes carrying hot water or steam are lagged with felt. This is done to

A. prevent them from rusting
B. prevent them from absorbing heat from the air
C. prevent them from conducting away heat to the air
D. prevent them from accidentally scalding someone
E. prevent them from becoming too hot

::A:: ::B:: ::C:: ::D:: ::E::

12 In order to prevent the loss of heat from an object by conduction, it is best to surround it by

A. rubber
B. asbestos
C. cotton wool
D. water
E. a vacuum

::A:: ::B:: ::C:: ::D:: ::E::

13 Five similar bottles contain equal quantities of boiling water.
Bottle 1 is wrapped with cotton wool.
Bottle 2 is wrapped with feathers.
Bottle 3 is wrapped with cloth.
Bottle 4 is wrapped with fur.
Bottle 5 is wrapped with paper.

a. Which bottle of water cools fastest?

A. bottle 1
B. bottle 2
C. bottle 3
D. bottle 4
E. bottle 5

::A:: ::B:: ::C:: ::D:: ::E::

b. Which covering should make the best heat insulator?

A. cotton wool
B. feathers
C. cloth
D. fur
E. paper

::A:: ::B:: ::C:: ::D:: ::E::

14 Five cups of similar size contain equal quantities of boiling water. The cups are made of plastic, glass, aluminium, clay and tin

a. In which cup does the hot water cool fastest?

A the plastic cup
B. the glass cup
C. the aluminium cup
D. the clay cup
E. the tin cup

::A:: ::B:: ::C:: ::D:: ::E::

b. Which cup retains heat energy best?

A. the plastic cup
B. the glass cup
C. the aluminium cup
D. the clay cup
E. the tin cup

::A:: ::B:: ::C:: ::D:: ::E::

15 Iron feels cold to the touch because it

A. rusts in air
B. absorbs heat
C. conducts away heat
D. is a metal
E. has a high melting point

::A:: ::B:: ::C:: ::D:: ::E::

16 On a very cold day a metal object feels colder than a wooden one, though both are at the same temperature.
This is because

A. the metal object retains heat better
B. the metal object conducts away heat more quickly
C. the metal object is heavier
D. the metal object passes more heat energy to our hands
E. none of the explanations is correct

::A:: ::B:: ::C:: ::D:: ::E::

17 Which statements are true?

I. Heat energy travels through metals better than through non-metals
II. Saucepans have wooden handles because heat energy does not travel through wood easily
III. Heat energy is passed from one end of a metal bar to the other end by molecules moving along the bar
IV. When a metal bar is heated, the molecules vibrate more vigorously

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

18 Air is a bad conductor of heat because

A. it is a mixture of many gases
B. hot air always rises
C. its molecules are very far apart
D. when its molecules are hot, they move away
E. it allows radiant heat to pass through it

::A:: ::B:: ::C:: ::D:: ::E::

19 Why does wool keep you warmer than cotton?

A. Wool is obtained from an animal
B. Wool is heavier than cotton
C. Wool is more lasting than cotton
D. Wool traps more air than cotton
E. Wool is commonly worn in cold countries

::A:: ::B:: ::C:: ::D:: ::E::

20 Birds 'fluff up' their feathers in cold weather. How does this keep them warm?

A. This traps more air
B. This increases the size
C. This increases the rate of breathing
D. This increases the chemical reactions in the body
E. This slows down the chemical reactions in the body

::A:: ::B:: ::C:: ::D:: ::E::

21 A sledge-dog buries its body in the snow to keep warm. Which statement below explains this behaviour?

A. The air trapped in the snow is a poor conductor of heat
B. By keeping still, the snow does not melt
C. Snow absorbs heat
D. Snow gives out heat
E. Snow is a poor conductor of heat

::A:: ::B:: ::C:: ::D:: ::E::

22 The rate at which heat flows from one end of a metal bar to the other end depends on which of the following factors?

I. the difference in temperature between the two ends of the bar
II. the cross-sectional area of the bar
III. the length of the bar
IV. the metal the bar is made of

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

23 Which statements are true?

I. Conduction takes place in a vacuum
II. Conduction takes place when one part of a solid is at a higher temperature than another part
III. Conduction in a metal is a slower process than conduction in water
IV. Good conductors of heat are good conductors of electricity

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

24 Choose the correct statements.

I. A convection current is due to hot air rising
II. When air is heated it expands and rises
III. Hot water is lighter than cold water
IV. Hot water on the top of a pond always sinks

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

25 Which statement about convection currents is incorrect?

A. Convection can take place in a liquid or in a gas
B. During convection heat energy makes the molecules rise
C. During convection cold molecules rise
D. During convection heat energy is transferred by the molecules rising and sinking
E. Convection currents are due to molecules circulating

::A:: ::B:: ::C:: ::D:: ::E::

26 Which statement explains why a fire causes a draught up a chimney?

A. Hot air contains less moisture
B. Hot air is lighter
C. A fire gives out heat energy
D. A fire gives out light energy
E. A chimney draws air upwards

::A:: ::B:: ::C:: ::D:: ::E::

27 In which of the following is heat transferred, at least partially, by convection?

I. warming a room by an electric fire
II. cooling a car engine by using a radiator
III. heating a beaker of water
IV. cooking a piece of meat on a saucepan

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

28 A car engine is usually cooled by which of the following?

A. convection of water
B. convection of air
C. conduction by the metallic parts
D. radiation of heat
E. all of the above

::A:: ::B:: ::C:: ::D:: ::E::

29 In which examples is heat transferred by radiation?

I. from the sun to the earth
II. from a lighted bulb to a hand placed below it
III. from a bunsen flame to a beaker of water above it
IV. from a fire to some boys standing around it

A. I, II and III
B. I and III
C. II and IV
D. I and III
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

30 You wish to wrap up a bottle of hot water so that the water will not become cold easily.
Which is the best substance to use?

A. white cloth
B. white paper
C. black cloth
D. silver-paper
E. a sheet of metal foil

::A:: ::B:: ::C:: ::D:: ::E::

31 Why should we wear light coloured clothes rather than dark clothes on a sunny day?

I. Light coloured clothes are good radiators of heat
II. Light coloured clothes are good reflectors of heat
III. Light coloured clothes are good conductors of heat
IV. Light coloured clothes are poor absorbers of heat

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

32 Which statement explains why a metal teapot has a polished surface?

A. A polished surface conducts heat easily
B. A polished surface does not conduct heat easily
C. A polished surface radiates heat easily
D. A polished surface does not radiate heat easily
E. A polished surface absorbs heat easily

::A:: ::B:: ::C:: ::D:: ::E::

33 In which ways can a cup of hot coffee lose heat?

I. by conduction
II. by convection
III. by radiation
IV. by evaporation

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. all

::A:: ::B:: ::C:: ::D:: ::E::

34 We can be sure that no heat from the sun reaches us by convection or conduction because

A. the distance between the sun and the earth is very great
B. light reaches us very fast
C. there are clouds in the sky
D. there is a vacuum between the sun and the earth
E. there is an atmosphere surrounding the earth

::A:: ::B:: ::C:: ::D:: ::E::

35 Choose the statement which is incorrect.

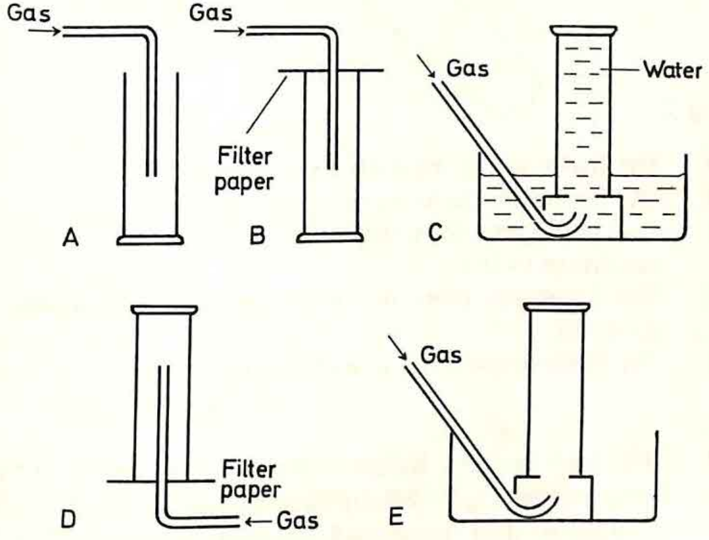
A. Radiated heat is absorbed more quickly by a dull black surface than by a polished surface
B. Radiated heat is lost more quickly from a dull black surface than from a polished surface
C. Radiated heat is reflected more by a polished surface than by a dull black surface
D. Radiated heat travels at the speed of sound
E. Radiated heat can pass through a vacuum

::A:: ::B:: ::C:: ::D:: ::E::

4 Hydrogen, acids and alkalis

Hydrogen

1 Which is the best method for collecting a gas jar of hydrogen?



::A:: ::B:: ::C:: ::D:: ::E::

fig 25

2 A test tube of hydrogen is inverted in a dish of water.

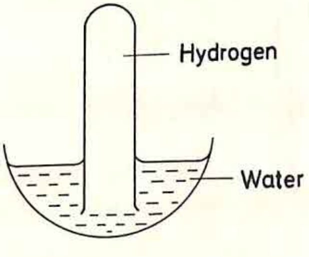


fig 26

This experiment demonstrates that

A. hydrogen reacts with water
B. hydrogen is insoluble in water
C. hydrogen is soluble in water
D. hydrogen is a light gas
E. hydrogen is an inactive gas

::A:: ::B:: ::C:: ::D:: ::E::

3 A lighted splint is inserted in a test tube of hydrogen as shown in the diagram. What happens?

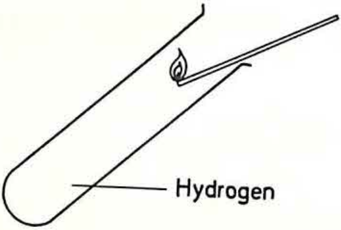


fig 27

A. The hydrogen burns with a pop sound
B. The hydrogen burns quietly
C. The hydrogen does not burn, but the lighted splint continues to burn
D. The hydrogen does not burn and the lighted splint goes out
E. The lighted splint burns with a bright flame

::A:: ::B:: ::C:: ::D:: ::E::

4 The two bottles balance each other when they both contain air. When one bottle is filled with hydrogen and balanced against the other, the chemical balance tilts to one side.

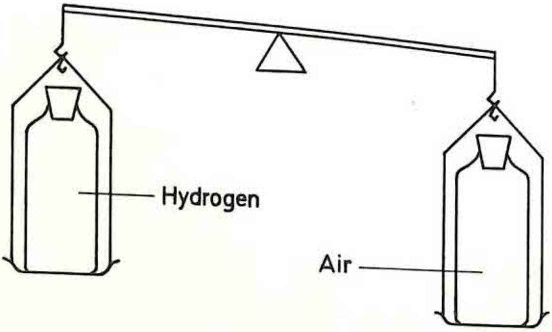


fig 28

This experiment demonstrates that

A. hydrogen is denser than air
B. hydrogen is less dense than air
C. hydrogen is the lightest gas
D. hydrogen always rises
E. hydrogen is present in air

::A:: ::B:: ::C:: ::D:: ::E::

5 Which of these statements are correct?

I. Hydrogen is insoluble in water
II. Hydrogen burns
III. Hydrogen does not support combustion
IV. Hydrogen is acidic

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

6 Which is the lightest gas?

A. oxygen
B. nitrogen
C. helium
D. hydrogen
E. carbon dioxide

::A:: ::B:: ::C:: ::D:: ::E::

7 Hydrogen is not safe for use in filling air-ships because

A. it is present in acids
B. it is an element
C. it is insoluble in water
D. it is the lightest gas
E. it burns easily

::A:: ::B:: ::C:: ::D:: ::E::

8 Which is a distinguishing test for hydrogen?

A. Hydrogen is neutral to pH paper
B. Hydrogen does not relight a glowing splint

C. Hydrogen does not dissolve in water
D. Hydrogen is a light gas
E. A test tube of hydrogen burns with a pop sound when a lighted splint is inserted into it

::A:: ::B:: ::C:: ::D:: ::E::

9 What is the reaction of hydrogen with bicarbonate indicator solution?

A. It turns the solution purple
B. It turns the solution orange-yellow
C. It turns the solution pink
D. It turns the solution chalky
E. It has no effect on the solution

::A:: ::B:: ::C:: ::D:: ::E::

10 What is the effect of passing hydrogen through lime-water?

A. It forms a chalky precipitate
B. It forms a blue precipitate
C. It forms a jelly green precipitate
D. It turns the lime-water orange-yellow
E. It has no effect on the lime-water

::A:: ::B:: ::C:: ::D:: ::E::

11 When a piece of moist pH paper (range 1 - 14) is dropped in a gas jar of hydrogen, the pH paper should give a value of about

A. 3
B. 5
C. 7
D. 9
E. 11

::A:: ::B:: ::C:: ::D:: ::E::

12 Pure hydrogen burns quietly with a pale

A. purple flame
B. green flame
C. yellow flame
D. blue flame
E. pink flame

::A:: ::B:: ::C:: ::D:: ::E::

13 When a large quantity of hydrogen is mixed with air and lighted, what will probably happen?

A. The mixture burns quietly
B. The mixture burns with a bright flame
C. The mixture will not burn
D. The mixture explodes
E. The mixture turns cloudy

::A:: ::B:: ::C:: ::D:: ::E::

14 Name the elements in this list.

I. carbon dioxide
II. hydrogen
III. air
IV. oxygen

A. I, II and IV
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

Burning of hydrogen

15 Study the diagram and answer the questions which follow.

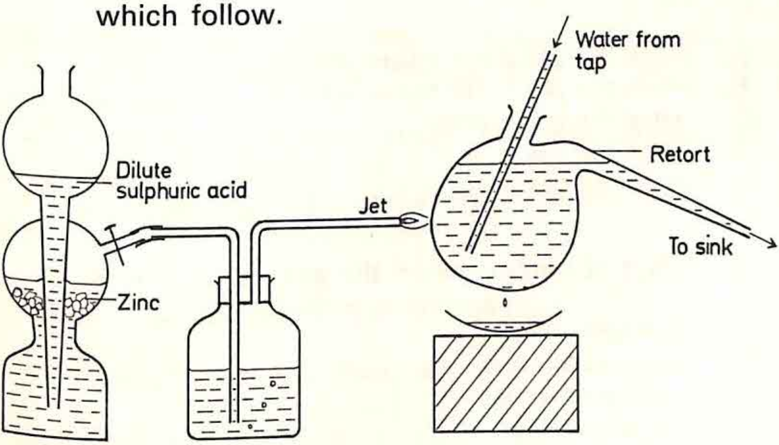


fig 29

a. What gas is produced in the flask when the acid and the zinc react?

A. oxygen
B. hydrogen
C. nitrogen
D. helium
E. carbon dioxide

::A:: ::B:: ::C:: ::D:: ::E::

b. What is the chemical in the bottle?

A. distilled water
B. concentrated sulphuric acid
C. concentrated hydrochloric acid
D. sodium hydroxide solution
E. ice water

::A:: ::B:: ::C:: ::D:: ::E::

c. Why must the gas pass through the chemical in the bottle?

A. to wet the gas
B. to dry the gas
C. to remove impurities
D. to make the gas acidic
E. to cool the gas

::A:: ::B:: ::C:: ::D:: ::E::

d. When is it safe to light the gas coming out of the jet?

A. when the gas is not mixed with air
B. when the gas is still mixed with air
C. when the gas is cool
D. when the gas is dry
E. when the gas is wet

::A:: ::B:: ::C:: ::D:: ::E::

e. What is formed when the gas burns in air?

A. hydrogen oxide
B. hydrogen chloride
C. hydrogen nitrate
D. carbon dioxide
E. nitrogen peroxide

::A:: ::B:: ::C:: ::D:: ::E::

f. What is the use of the retort with running water?

A. to give a cool surface for the water vapour to condense
B. to give a cool surface for the acid vapour to condense
C. to make the gas burn brighter
D. to lower the temperature of the flame
E. to see the flames easily

::A:: ::B:: ::C:: ::D:: ::E::

g. This experiment is done to prove that

A. hydrogen burns in air
B. water is not the same as hydrogen oxide
C. water is a compound of hydrogen and oxygen
D. water is a mixture of hydrogen and oxygen
E. water is a mixture of more than two gases

::A:: ::B:: ::C:: ::D:: ::E::

16 How can you tell whether a given liquid is water?

A. by testing it with lime-water
B. by testing it with bicarbonate indicator solution
C. by testing it with pH paper
D. by finding out its boiling point and freezing point
E. by finding out whether it contains dissolved substances

::A:: ::B:: ::C:: ::D:: ::E::

17 During which of the following experiments is a compound made?

A. mixing a gas jar of hydrogen with a gas jar of oxygen
B. mixing two gas jars of hydrogen with one gas jar of oxygen
C. mixing one gas jar of oxygen with four gas jars of nitrogen
D. passing hydrogen through a freezing mixture
E. burning the hydrogen coming out of a jet

::A:: ::B:: ::C:: ::D:: ::E::

Action of metals on cold water

18 Which substance floats on water?

A. tin
B. aluminium
C. magnesium
D. sodium
E. calcium

::A:: ::B:: ::C:: ::D:: ::E::

19 Which substance sinks and reacts vigorously with water to set free hydrogen?

A. tin
B. copper
C. calcium
D. sodium
E. magnesium

::A:: ::B:: ::C:: ::D:: ::E::

20 Which substances react with water to set free hydrogen?

I. sodium
II. calcium
III. magnesium
IV. aluminium

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

21 Which substance reacts most vigorously with water?

A. silver
B. zinc
C. calcium
D. sodium
E. magnesium

::A:: ::B:: ::C:: ::D:: ::E::

22 Choose the list of metals which is in the proper order of activity, starting with the most active metal.

A. sodium, magnesium, calcium, iron
B. sodium, calcium, magnesium, iron
C. calcium, sodium, magnesium, iron
D. calcium, magnesium, sodium, iron
E. iron, magnesium, calcium, sodium

::A:: ::B:: ::C:: ::D:: ::E::

23 A piece of sodium is dropped in a beaker of water and hydrogen is set free.

a. Where does the hydrogen come from?

A. from the sodium
B. from the air
C. from the water
D. from the air dissolved in the water
E. from the hydrogen dissolved in the water

::A:: ::B:: ::C:: ::D:: ::E::

b. What solution is formed?

A. sodium sulphate
B. sodium bicarbonate
C. sodium carbonate
D. sodium hydroxide
E. sodium oxide

::A:: ::B:: ::C:: ::D:: ::E::

c. Which statement about the solution is true?

A. The solution is acidic
B. The solution is alkaline
C. The solution turns chalky with carbon dioxide
D. The solution turns orange-yellow when an acid is added to it
E. The solution reacts with zinc to set free a gas

::A:: ::B:: ::C:: ::D:: ::E::

24 A piece of substance sinks in water and reacts with it vigorously to set free a gas which is collected in a test tube.

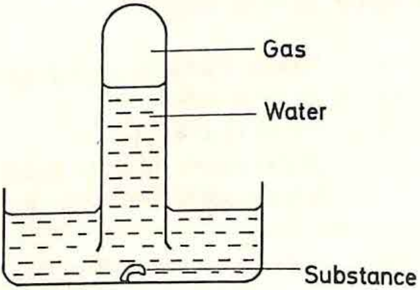


fig 30

a. Which of the following substances gives such a reaction?

A. zinc
B. copper
C. magnesium
D. sodium
E. calcium

::A:: ::B:: ::C:: ::D:: ::E::

b. What gas is collected in the test tube?

A. oxygen
B. nitrogen
C. hydrogen
D. carbon dioxide
E. chlorine

::A:: ::B:: ::C:: ::D:: ::E::

c. What can you do to identify the gas?

A. test the gas with a piece of moist pH paper
B. test the gas with bicarbonate indicator solution
C. test the gas with lime-water
D. test the gas with sodium hydroxide solution
E. test the gas with a lighted splint

::A:: ::B:: ::C:: ::D:: ::E::

d. What liquid is left in the dish after the substance has completely reacted with the water?

A. calcium hydroxide
B. sodium hydroxide
C. magnesium hydroxide
D. dilute acid
E. hydrogen oxide

::A:: ::B:: ::C:: ::D:: ::E::

e. How would you prove that the liquid left in the dish is the same as lime-water?

A. pass carbon dioxide through the liquid
B. pass oxygen through the liquid
C. add a piece of zinc to the liquid
D. drop a piece of pH paper into the liquid
E. pour a little bicarbonate indicator solution into the liquid

::A:: ::B:: ::C:: ::D:: ::E::

25 What is the aim of the experiment set up below?

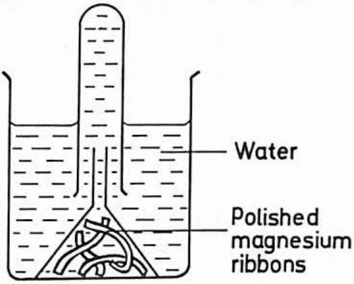


fig 31

A. to show that magnesium reacts with water to set free oxygen
B. to show that magnesium reacts with water to set free hydrogen
C. to show that magnesium does not react with water
D. to show that magnesium rusts in water
E. to show that magnesium combines with oxygen in the water

::A:: ::B:: ::C:: ::D:: ::E::

Action of metals on dilute acids

26 Which of the following metals react with dilute hydrochloric acid to set free hydrogen?

I. magnesium
II. lead
III. zinc
IV. copper

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

27 Choose the list of metals which is in order of their reaction with dilute hydrochloric acid, starting with the most reactive metal.

A. zinc, magnesium, iron, tin
B. zinc, magnesium, tin, iron
C. magnesium, zinc, tin, iron
D. magnesium, zinc, iron, tin
E. iron, tin, magnesium, zinc

::A:: ::B:: ::C:: ::D:: ::E::

28 Which metals do not react with dilute hydrochloric acid to set free hydrogen?

I. mercury
II. lead
III. silver
IV. aluminium

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

29 All acids contain the gas

A. oxygen
B. nitrogen
C. hydrogen
D. carbon dioxide
E. argon

::A:: ::B:: ::C:: ::D:: ::E::

30 In question 29, part or all of this gas can be displaced by a suitable

A. carbonate
B. oxide
C. hydroxide
D. salt
E. metal

::A:: ::B:: ::C:: ::D:: ::E::

31 An iron saucepan should not be used for boiling vinegar because

A. iron reacts with vinegar
B. iron rusts are formed
C. iron makes the vinegar salty
D. iron makes the vinegar bitter
E. iron makes the vinegar ferment

::A:: ::B:: ::C:: ::D:: ::E::

32 Choose the correct statements.

I. All metals react with dilute acids to set free hydrogen
II. Some metals react with dilute acids to set free hydrogen
III. All metals react with alkalis to set free hydrogen
IV. Some metals react with water to set free hydrogen

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

33 One chemical test that would distinguish a piece of zinc from a piece of lead is

A. zinc reacts with dilute hydrochloric acid, but lead does not
B. lead reacts with dilute hydrochloric acid, but zinc does not
C. zinc reacts with cold water, but lead does not
D. lead reacts with cold water, but zinc does not
E. zinc is harder than lead

::A:: ::B:: ::C:: ::D:: ::E::

34 Which test can be used to distinguish an acid from an alkali, without using an indicator?

A. An acid is more corrosive than an alkali
B. An acid is less corrosive than an alkali
C. An acid is colourless, but an alkali may be coloured
D. An acid reacts with zinc to set free hydrogen, but an alkali does not
E. An alkali reacts with zinc to set free hydrogen, but an acid does not

::A:: ::B:: ::C:: ::D:: ::E::

Acids and alkalis

35 What is the use of pH paper?

A. to test whether a substance contains hydrogen
B. to test whether a substance contains carbon dioxide
C. to test whether a substance contains oxygen
D. to test whether a gas burns or not
E. to test whether a substance is acidic or alkaline

::A:: ::B:: ::C:: ::D:: ::E::

36 Which statements are true?

I. Dilute acids are sour
II. Dilute alkalis are bitter
III. An acid neutralises an alkali
IV. All acids are solutions

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

37 Which of the following substances is acidic?

A. baking powder
B. orange juice
C. soap solution
D. washing soda
E. common salt solution

::A:: ::B:: ::C:: ::D:: ::E::

38 Which of the following substances are alkaline?

I. vinegar
II. baking powder
III. tea
IV. milk of magnesia

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

39 You have spilt some dilute sulphuric acid. Which substance would you use to neutralise it?

A. distilled water
B. sugar solution
C. dilute hydrochloric acid
D. dilute sodium hydroxide solution
E. vinegar

::A:: ::B:: ::C:: ::D:: ::E::

40 Why is lime added to soil?

A. to kill earthworms
B. to kill insects
C. to add humus to the soil
D. to make the soil less alkaline
E. to make the soil less acidic

::A:: ::B:: ::C:: ::D:: ::E::

41 Which substance in our stomach can be neutralised by milk of magnesia?

A. enzymes
B. oil
C. sugar
D. proteins
E. gastric juice

::A:: ::B:: ::C:: ::D:: ::E::

42 What process does the equation represent?

Acid + alkali → salt + water

A. decomposition
B. precipitation
C. combination
D. neutralisation
E. crystallisation

::A:: ::B:: ::C:: ::D:: ::E::

43 What is substance X in the equation below?

Dilute hydrochloric acid + sodium hydroxide → substance X + water

A. hydrogen chloride
B. sodium bicarbonate
C. sodium carbonate
D. sodium chloride
E. sodium sulphate

::A:: ::B:: ::C:: ::D:: ::E::

44 What is universal indicator used for?

A. to test how concentrated a solution is
B. to test how acidic or alkaline a solution is
C. to find out how much solid is dissolved in a solution
D. to find out how much water is present in a solution
E. to find out what substances are dissolved in a solution

::A:: ::B:: ::C:: ::D:: ::E::

45 A beaker contains 20 cm^3 of sodium hydroxide solution. One gram of solid sodium hydroxide has been dissolved in it. 20 cm^3 of dilute hydrochloric acid are required to neutralise the alkaline solution.

a. If 5 cm^3 of the alkali is diluted with 5 cm^3 of water, how much solid is dissolved in the diluted solution?

A. $\frac{1}{4}$ g
B. $\frac{1}{2}$ g
C. 1 g
D. $1\frac{1}{2}$ g
E. 2 g

::A:: ::B:: ::C:: ::D:: ::E::

b. If 20 cm^3 of water are added to the 20 cm^3 of alkali, what weight of solid is present in the solution now?

A. $\frac{1}{2}$ g
B. 1 g
C. 2 g
D. 4 g
E. 5 g

::A:: ::B:: ::C:: ::D:: ::E::

c. How much acid is required to neutralise 10 cm^3 of the original sodium hydroxide solution?

A. 1 cm^3
B. 5 cm
C. 10 cm^3
D. 20 cm^3
E. 40 cm^3

::A:: ::B:: ::C:: ::D:: ::E::

d. If the original 20 cm^3 of sodium hydroxide solution is diluted with 10 cm^3 of water, how much acid is required to neutralise the new volume of alkali?

A. 5 cm
B. 10 cm
C. 15 cm
D. 20 cm
E. 30 cm

::A:: ::B:: ::C:: ::D:: ::E::

5 Detecting the environment

The eye and light

1 Study the diagram of the eye and then answer the questions which follow.

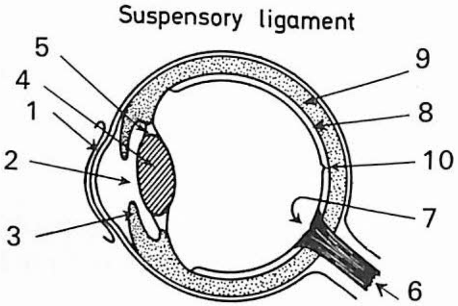


fig 32

For questions a to e, choose the answers from the terms given below.

Terms

A. lens
B. pupil
C. cornea
D. suspensory ligament
E. iris

a. The curved surface numbered 1 is called the

::A:: ::B:: ::C:: ::D:: ::E::

b. The opening numbered 2 is called the

::A:: ::B:: ::C:: ::D:: ::E::

c. The muscles numbered 3 are called the

::A:: ::B:: ::C:: ::D:: ::E::

d. The transparent object numbered 4 is called the

::A:: ::B:: ::C:: ::D:: ::E::

e. The membrane numbered 5 which holds the lens in position is called the

::A:: ::B:: ::C:: ::D:: ::E::

For questions f to i, choose the answers from the list of terms given below.

Terms

A. yellow spot
B. blind spot
C. retina
D. optic nerve
E. choroid

f. What is the part numbered 6 called?

::A:: ::B:: ::C:: ::D:: ::E::

g. What name is given to the area numbered 7?

::A:: ::B:: ::C:: ::D:: ::E::

h. What do you call the light sensitive layer of cells numbered 8?

::A:: ::B:: ::C:: ::D:: ::E::

i. What do you call the middle layer of the eye-ball numbered 9?

::A:: ::B:: ::C:: ::D:: ::E::

2 Questions a to f consist of six statements preceded by five lettered terms. For each statement, choose the term which is most closely related to it. Each term may be used more than once.

Terms

A. cornea
B. iris
C. sclerotic
D. retina
E. choroid

a. This white tough fibrous layer protects the eye

::A:: ::B:: ::C:: ::D:: ::E::

b. This black layer is rich in blood vessels

::A:: ::B:: ::C:: ::D:: ::E::

c. This layer absorbs light rays and prevents reflection in the eye-ball

::A:: ::B:: ::C:: ::D:: ::E::

d. This layer receives light stimuli

::A:: ::B:: ::C:: ::D:: ::E::

e. This is the transparent front part of the eye

::A:: ::B:: ::C:: ::D:: ::E::

f. This acts as a shutter and controls the size of the pupil

::A:: ::B:: ::C:: ::D:: ::E::

3 Questions a to e consist of five statements preceded by five lettered headings. For each statement, choose the heading which is most closely related to it. Each heading may be used once, more than once, or not at all.

Headings

A. pupil
B. lens
C. suspensory ligament
D. blind spot
E. optic nerve

a. It holds the eye lens in its place

::A:: ::B:: ::C:: ::D:: ::E::

b. It controls the amount of light passing into the eye

::A:: ::B:: ::C:: ::D:: ::E::

c. It carries light stimuli to the brain

::A:: ::B:: ::C:: ::D:: ::E::

d. It forms images on the retina

::A:: ::B:: ::C:: ::D:: ::E::

e. It becomes larger when we are in a dark place

::A:: ::B:: ::C:: ::D:: ::E::

4 Which part of the eye can change the thickness of the eye lens?

A. the ciliary muscles
B. the suspensory ligaments
C. the iris
D. the cornea
E. the optic nerve

::A:: ::B:: ::C:: ::D:: ::E::

5 The eye-ball is filled with a jelly-like substance. Of what help is the substance?

A. It lubricates the lens
B. It maintains the shape of the eye-ball
C. It kills germs entering the eye
D. It filters dust
E. It disperses light

::A:: ::B:: ::C:: ::D:: ::E::

6 Which diagram correctly represents the shape of the lens of a mammalian eye?

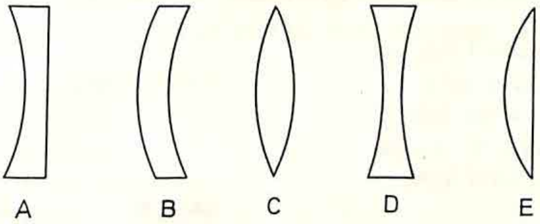


fig 33

::A:: ::B:: ::C:: ::D:: ::E::

7 The retina of the eye is

A. the circular coloured part at the front
B. the white part at the front
C. the layer of light sensitive cells at the back
D. the jelly inside the eye-ball
E. the liquid between the front of the eye and the lens

::A:: ::B:: ::C:: ::D:: ::E::

8 The iris is

A. the outer transparent layer of the eye
B. the light sensitive layer of the eye
C. the white portion at the front of the eye
D. the hole in the centre of the eye
E. the circular coloured portion at the front of the eye

::A:: ::B:: ::C:: ::D:: ::E::

9 Which statement correctly describes the image formed in the eye?

A. It is upright, diminished and real
B. It is inverted, enlarged and real
C. It is inverted, diminished and virtual
D. It is inverted, diminished and real
E. It is upright, enlarged and virtual

::A:: ::B:: ::C:: ::D:: ::E::

10 The human eye focuses by

A. changing the curvature of the cornea
B. changing the curvature of the lens
C. changing the position of the lens
D. changing the size of the pupil
E. increasing the surface area of the retina

::A:: ::B:: ::C:: ::D:: ::E::

11 What is the main function of the iris?

A. to protect the eye
B. to focus light
C. to receive light
D. to form an image
E. to control light

::A:: ::B:: ::C:: ::D:: ::E::

12 The lens from a bull's eye is removed and placed on a sheet of newspaper. The print will be seen to be

A. magnified and erect
B. magnified and inverted
C. diminished and erect
D. diminished and inverted
E. diminished and blurred

::A:: ::B:: ::C:: ::D:: ::E::

13 Which words describe the image in a pinhole camera?

I. upright
II. inverted
III. enlarged
IV. diminished
V. real
VI. virtual

A. I, III and V
B. I, IV and V
C. I, IV and VI
D. II, III and VI
E. II, IV and V

::A:: ::B:: ::C:: ::D:: ::E::

14 What happens to the image in a pinhole camera if the hole is slightly enlarged?

A. It becomes diminished
B. It becomes inverted
C. It becomes sharper
D. It becomes blurred
E. The image is not affected

::A:: ::B:: ::C:: ::D:: ::E::

15 What happens to the image if a biconvex lens is placed in front of the pinhole in question 14?

A. It becomes sharper
B. It becomes blurred
C. It becomes bigger
D. It becomes smaller
E. No image is formed

::A:: ::B:: ::C:: ::D:: ::E::

16 Which statements about a pinhole camera are correct?

I. The image is smaller if the object is further away
II. A biconvex lens placed in front of the pinhole focuses a sharper image on the screen
III. The inner surface of the camera should be black
IV. A sharper image is obtained if the pinhole is enlarged

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

17 Which diagram correctly shows the path of the ray of light through the glass prism and out into the air?

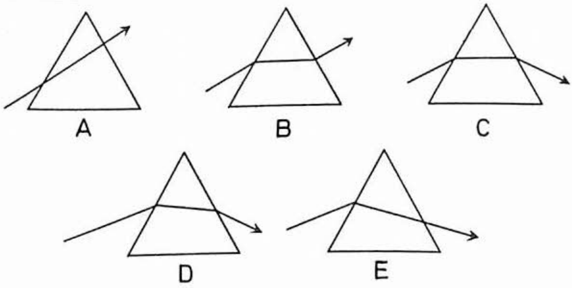


fig 34

::A:: ::B:: ::C:: ::D:: ::E::

18 Study the diagram and then answer the questions which follow.

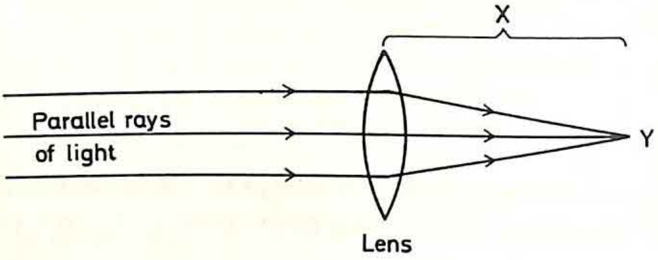


fig 35

a. The distance X is called the ...... of the lens.

A. focal length
B. focus
C. axis
D. optical distance
E. image distance

::A:: ::B:: ::C:: ::D:: ::E::

b. The point Y is called the ...... of the lens.

A. image point
B. object point
C. focus
D. optical centre
E. pivot

::A:: ::B:: ::C:: ::D:: ::E::

19 Which types of lenses can converge rays of light?

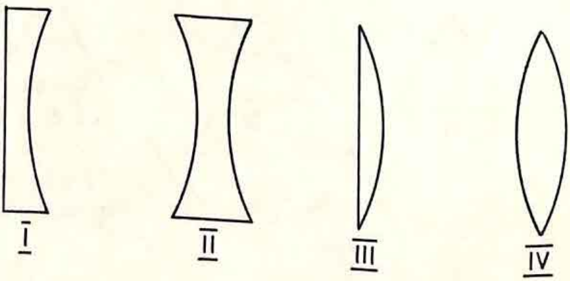


fig 36

A. I, II and III
B. I and III
C. II and IV
D. I and II
E. III and IV

::A:: ::B:: ::C:: ::D:: ::E::

20 Which statements are true?

I. A biconvex lens converges light
II. A biconvex lens cannot form an image on a screen
III. A biconvex lens can be used as a magnifying glass
IV. A thin biconvex lens has a shorter focal length than a thick biconvex lens

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

21 The opening or aperture in a camera is similar to the ...... in a mammalian eye.

A. cornea
B. retina
C. choroid
D. pupil
E. iris

::A:: ::B:: ::C:: ::D:: ::E::

22 The part of the human eye which is comparable to the film in a camera is

A. the iris
B. the retina
C. the lens
D. the pupil
E. the eye muscles

::A:: ::B:: ::C:: ::D:: ::E::

23 Which statement is incorrect?

A. A camera changes its focus by changing the distance between the lens and the film
B. A human eye changes its focus by changing the distance between the lens and the retina
C. The image in a camera is similar to the image in a human eye
D. A camera controls light by changing the size of the aperture and the speed of the shutter
E. A human eye controls light by changing the size of the pupil

::A:: ::B:: ::C:: ::D:: ::E::

24 Which comparison is incorrect?

	Eye	**Camera**
A.	has a lens	has a lens
B.	has a blackened interior	has a blackened interior
C.	has light sensitive retina	has light sensitive film
D.	has a hollow filled with a jelly	has a hollow filled with a chemical
E.	has a pupil	has an aperture

::A:: ::B:: ::C:: ::D:: ::E::

Vision

25 Which line is longer, AB or CD? Measure the lines.

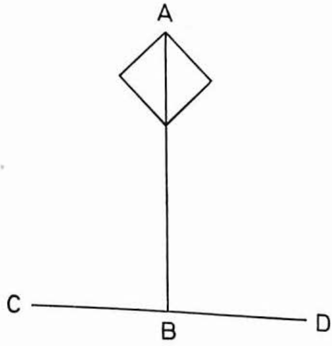


fig 37

One line appears longer than the other because of

A. short-sightedness
B. long-sightedness
C. colour blindness
D. faulty eye lens
E. faulty eye muscles

::A:: ::B:: ::C:: ::D:: ::E::

26 This experiment in question 25 demonstrates to us that

A. our eyes are colour blind
B. our eyes are sense organs
C. our eyes are not sense organs
D. our eyes are perfect
E. our eyes are not perfect

::A:: ::B:: ::C:: ::D:: ::E::

27 If an image of an object falls on the blind spot of an eye, the eye will

A. not see the colour of the object
B. not see the object
C. see the object much enlarged
D. see the object much diminished
E. see the object black

::A:: ::B:: ::C:: ::D:: ::E::

28 Colour vision test cards are usually used to detect

A. short-sightedness
B. long-sightedness
C. optical illusion
D. colour blindness
E. habit

::A:: ::B:: ::C:: ::D:: ::E::

29 Which statements are true?

I. Some people are colour blind
II. Sometimes the brain interprets signals from the eyes incorrectly
III. Not all animals can distinguish colours
IV. Of all animals, only man has stereoscopic vision

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

The ear and sound

30 Study the diagram showing a longitudinal section through an ear and then answer the questions which follow.

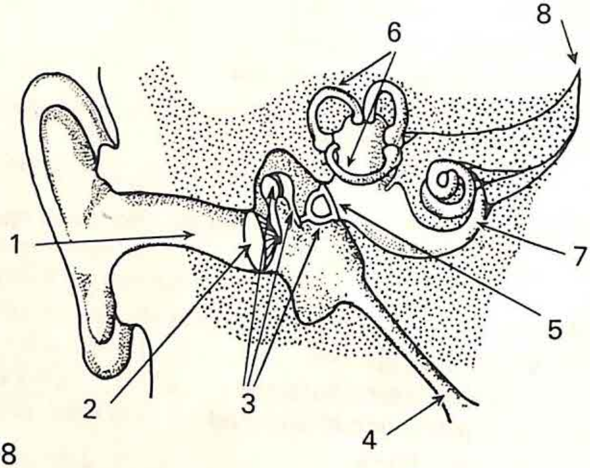


fig 38

For questions a to d, choose the answers from the terms given below.

Terms

A. ear ossicles
B. eustachian tube
C. auditory canal
D. tympanum
E. semi-circular canals

a. What do you call the passage numbered 1?

::A:: ::B:: ::C:: ::D:: ::E::

b. What do you call the membrane numbered 2?

::A:: ::B:: ::C:: ::D:: ::E::

c. What do you call the three small bones numbered 3?

::A:: ::B:: ::C:: ::D:: ::E::

d. What do you call the passage numbered 4?

::A:: ::B:: ::C:: ::D:: ::E::

For questions e to h, choose the answers from the terms given below.

Terms

A. auditory nerve
B. oval window
C. cochlea
D. semi-circular canals
E. auditory canal

e. What do you call the membrane labelled 5?

::A:: ::B:: ::C:: ::D:: ::E::

f. What do you call the structure labelled 6?

::A:: ::B:: ::C:: ::D:: ::E::

g. What do you call the organ labelled 7?

::A:: ::B:: ::C:: ::D:: ::E::

h. What do you call the part labelled 8?

::A:: ::B:: ::C:: ::D:: ::E::

Questions 31 - 40

These questions are divided into two groups of five questions in each group. Each group of questions consists of five numbered statements preceded by five lettered headings. For each numbered statement, choose the heading which is most clearly related to it. Each heading may be used once, more than once, or not at all.

Headings

A. auditory canal
B. tympanum
C. oval window
D. eustachian tube
E. cochlea

31 It is the first membrane to vibrate when sound waves reach the ear.

::A:: ::B:: ::C:: ::D:: ::E::

32 It is a membrane which passes vibrations from the ear bones to the inner ear.

::A:: ::B:: ::C:: ::D:: ::E::

33 It directs sound waves to the ear drum.

::A:: ::B:: ::C:: ::D:: ::E::

34 It is the actual organ for hearing.

::A:: ::B:: ::C:: ::D:: ::E::

35 It is a membrane which separates the outer ear from the middle ear.

::A:: ::B:: ::C:: ::D:: ::E::

Headings

A. ear ossicles
B. semi-circular canals
C. auditory nerves
D. eustachian tubes
E. auditory canals

36 These magnify the vibrations and pass them to the inner ear.

::A:: ::B:: ::C:: ::D:: ::E::

37 These help us to maintain posture and balance.

::A:: ::B:: ::C:: ::D:: ::E::

38 These send impulses to the brain.

::A:: ::B:: ::C:: ::D:: ::E::

39 These are three small bones.

::A:: ::B:: ::C:: ::D:: ::E::

40 Air from the mouth can get into the middle ear through these.

::A:: ::B:: ::C:: ::D:: ::E::

41 An eustachian tube is a tube which leads from

A. an ear to the throat
B. an ear to the brain
C. an eye to the brain
D. a kidney to the urinary bladder
E. an ovary to the uterus

::A:: ::B:: ::C:: ::D:: ::E::

42 Which of the following structures are found in the ear?

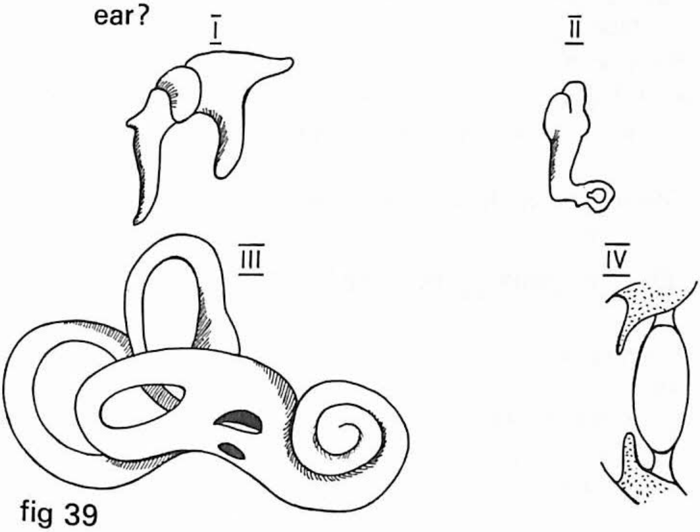


fig 39

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

43 Which of the following parts contain a fluid?

I. eustachian tube
II. semi-circular canals
III. auditory canal
IV. cochlea

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

44 Which term should be in the blank?

Auditory canal → …… → ear bones → oval window

A. semi-circular canals
B. eustachian tube
C. cochlea
D. ear ossicles
E. tympanum

::A:: ::B:: ::C:: ::D:: ::E::

45 Which term should go in the blank?

Oval window → cochlea → ……… → brain

A. tympanum
B. ear drum
C. semi-circular canals
D. auditory nerve
E. optic nerve

::A:: ::B:: ::C:: ::D:: ::E::

46 Choose the statements which are correct.

I. The range of vibrations which can be heard varies from person to person
II. The normal range of vibrations which a young person can hear is between about 20 cycles per second and 20,000 cycles per second
III. As a person grows older, the range of vibrations he can hear becomes smaller
IV. Many animals can hear sounds which a human being cannot hear

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

47 The number of vibrations per second is called

A. the pitch
B. the frequency
C. the sound waves
D. the sound stimulus
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

48 An audio-signal generator is used to produce sounds of different frequencies. A class of pupils hear the sounds. Which of the following statements can be proved by this experiment?

I. Some pupils can hear a sound of low frequency, when some cannot
II. Some pupils can hear a sound of high frequency, when some cannot
III. All pupils can hear the sounds, no matter how low the frequencies are
IV. All pupils can hear the sounds, no matter how high the frequencies are

A. I and II
B. I only
C. II only
D. III only
E. IV only

::A:: ::B:: ::C:: ::D:: ::E::

49 Which factors affect the pitch produced by a wire?

I. its length
II. its tension
III. its material
IV. its thickness

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

50 If the wire of a guitar is shortened, what change will take place in the sound produced?

A. the pitch rises
B. the pitch falls
C. the frequency decreases
D. the quality changes
E. no change takes place

::A:: ::B:: ::C:: ::D:: ::E::

51 Which statements are incorrect?

I. The longer the vibrating wire, the lower is the pitch
II. The thicker the vibrating wire, the lower is the pitch
III. A low frequency gives a low pitch
IV. A wire of high tension produces a low pitch

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

52 Two tins and a string are connected as shown in the diagram. If a sound is made into tin 1, it can be heard in tin 2. Which of the following contribute to make this possible?

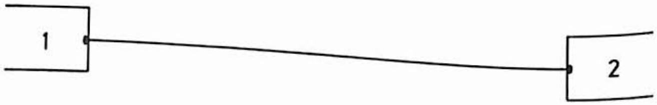


fig 40

I. The bottom of tin 1 vibrates when the sound is made into it
II. The string carries vibrations
III. The bottom of tin 2 vibrates
IV. Tin 2 makes the air in it vibrate

A. I, II and III
B. I and III
C. II and IV
D. none
E. all

::A:: ::B:: ::C:: ::D:: ::E::

53 Choose the statement which is false.

A. Sound is caused by vibrations
B. It is difficult to detect the direction of a sound when one is blindfolded
C. Sound travels better through air than through a rod
D. The highness or lowness of a sound is called its pitch
E. The pitch of a sound depends on its frequency

::A:: ::B:: ::C:: ::D:: ::E::

54 The experiment is set up and the bell is heard to ring. Then air is sucked out of the bell jar.

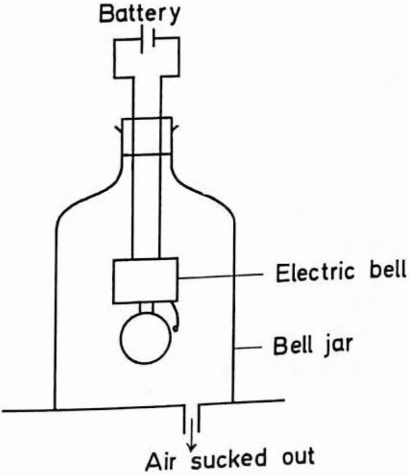


fig 41

What does the experiment demonstrate?

A. Sound can travel through air
B. Sound can travel through air better if the pressure is low
C. Sound cannot travel through a vacuum
D. Sound is caused by vibrations
E. Sound is a form of energy

::A:: ::B:: ::C:: ::D:: ::E::

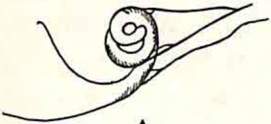
55 Sound is transmitted

A. by air, but by no other gases
B. by air and all other gases, but not by liquids
C. by air and liquids, but not by solids
D. by air, liquids and solids, but not by a vacuum
E. by air, liquids, solids and a vacuum

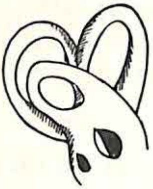
::A:: ::B:: ::C:: ::D:: ::E::

Balance

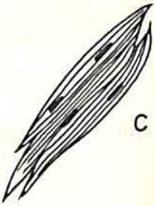
56 Which organ illustrated below helps us to keep our balance?



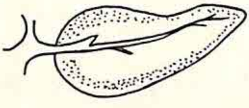
A



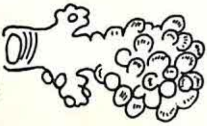
B



C



D



E

::A:: ::B:: ::C:: ::D:: ::E::

57 The organ which helps us to keep our posture and balance is called

A. the cochlea
B. the tympanum
C. the semi-circular canals
D. the sclerotic
E. the cornea

::A:: ::B:: ::C:: ::D:: ::E::

58 This organ named in question 57

A. is filled with oxygen
B. is filled with air only
C. contains water
D. contains a liquid which is not water
E. is empty

::A:: ::B:: ::C:: ::D:: ::E::

59 A boy explains how the semi-circular canals help us to balance. Which explanation, if any, is incorrect?

I. In the semi-circular canals are fine projections from sensory cells
II. The sensory cells are connected by nerves to the brain
III. The semi-circular canals contain a fluid which swirls about when we move our head
IV. Any movement of the fluid is detected by the sensory cell projections, which send impulses to the brain

A. I
B. II
C. III
D. IV
E. all are correct

::A:: ::B:: ::C:: ::D:: ::E::

Taste, smell and other senses

60 The structures that respond to sweetness, sourness, saltiness and bitterness are

A. the auditory nerves
B. the optic nerves
C. the spinal nerves
D. the taste buds
E. the glands

::A:: ::B:: ::C:: ::D:: ::E::

61 Which statements are correct?

I. There are nerve endings on the surface of the tongue
II. The nerve endings on the tongue are connected by nerves to the brain
III. Substances which dissolve in saliva stimulate the nerve endings on the tongue
IV. Every part of the tongue is equally sensitive to all tastes

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

62 The diagram represents a tongue.

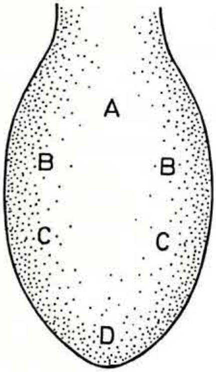


fig 43

a. Which area is especially sensitive to bitter taste?

::A:: ::B:: ::C:: ::D:: ::E::

b. Which area is especially sensitive to sour taste?

::A:: ::B:: ::C:: ::D:: ::E::

c. Which area is especially sensitive to sweet taste?

::A:: ::B:: ::C:: ::D:: ::E::

d. Which area is especially sensitive to salty taste?

::A:: ::B:: ::C:: ::D:: ::E::

63 Which statements about the nose are true?

I. There are nerve endings in our nose
II. A substance which gives off a smell also gives off a vapour, which stimulates the nerve endings
III. The stimulated nerve endings send impulses along nerves to the brain
IV. The brain interprets and differentiates the smell

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

64 Which of these organs respond to the stimuli of chemicals?

I. the eye
II. the nose
III. the ear
IV. the tongue

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

65 A boy placed his left hand in ice water and his right hand in hot water. After some time he placed both hands in luke warm water. His left hand felt that the luke warm water was hot, while his right hand felt that the water was cold. This experiment demonstrates that

A. there are no nerve endings in our hands
B. the nerve endings in our hands are very sensitive
C. the nerve endings in our hands are sometimes unreliable
D. the nerve endings in our hands are not connected to the nervous system
E. the nerve endings in our hands are not sensitive to heat

::A:: ::B:: ::C:: ::D:: ::E::

66 What is the function of the nervous system?

A. It keeps the organs in the body in good working condition
B. It directs the work of the organs in the body
C. It controls the amount of liquid in the body
D. It relays impulses from one part of the body to the other
E. It makes new cells in the body

::A:: ::B:: ::C:: ::D:: ::E::

67 Our central nervous system consists of which of the following?

I. the brain
II. the spinal cord
III. the nerves
IV the sense organs

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

68 In relation to the size of animals, man has the largest brain. This probably explains the fact that

A. man walks upright
B. man is the most intelligent animal
C. man needs education
D. man lives longer than all animals
E. man moves about more than all animals

::A:: ::B:: ::C:: ::D:: ::E::

69 For questions a to d choose the answers from the headings given below.

Headings

A. big brain (cerebrum)
B. small brain (cerebellum)
C. spinal bulb (medulla oblongata)
D. spinal cord
E. nerves

a. Which part is responsible for learning?

::A:: ::B:: ::C:: ::D:: ::E::

b. Which part helps a person to maintain his balance?

::A:: ::B:: ::C:: ::D:: ::E::

c. Which part is the centre for reflex actions?

::A:: ::B:: ::C:: ::D:: ::E::

d. Which part controls heart beats and the rate of breathing?

::A:: ::B:: ::C:: ::D:: ::E::

70 Which is an example of a reflex action?

A. A boy dived into a swimming pool
B. A boy stepped on a sharp nail and gave a loud yell of pain
C. A boy climbed up a tree
D. A boy read a book aloud
E. A boy solved a problem

::A:: ::B:: ::C:: ::D:: ::E::

71 Which of the following actions is not a reflex action?

A. secreting saliva on seeing a sour mango
B. getting excited on seeing an accident
C. blinking the eyelids
D. pulling your hand away quickly on touching a hot iron
E. running in a race

::A:: ::B:: ::C:: ::D:: ::E::

72 A doctor asked a boy to sit with his right leg crossing his left leg so that the right leg did not touch the floor. The doctor then tapped just below the knee-cap of the right leg with an instrument. What was the doctor trying to find out?

A. the boy's reflex action
B. the boy's voluntary action
C. the boy's blood pressure
D. the boy's muscle strength
E. the boy's centre for pain

::A:: ::B:: ::C:: ::D:: ::E::

73 What is the reaction of the iris if a dim light is shone on it?

A. It closes the pupil completely
B. It makes the pupil smaller
C. It opens the pupil bigger

D. It makes the pupil into a slit
E. It is not affected by light

::A:: ::B:: ::C:: ::D:: ::E::

74 Which statements are true?

I. It is more difficult to know the taste of food if we cannot see it and smell it
II. Some parts of our body are more sensitive to pain than others
III. Some people have a faster reaction time than others
IV. A reflex action is not controlled by the brain

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

75 Which of the following are sense organs?

I. the eye
II. the cochlea
III. the skin
IV. the tongue

A. I, II and III
B. I and III
C. II and IV
D. I and IV
E. all

::A:: ::B:: ::C:: ::D:: ::E::

76 Which pair of items is incorrectly matched?

A. ear : sound
B. eye : light
C. skin : emotion
D. tongue: taste
E. nose : smell

::A:: ::B:: ::C:: ::D:: ::E::

6 Support and movement

Force

1 What can a force do?

I. It can change the shape of a body
II. It can stop a moving body
III. It can make a stationary body move
IV. It can change the direction of a moving body

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

2 A ball is rolled on a field. Soon the ball stops by itself. What causes the ball to stop?

A. force of gravity
B. force of friction
C. magnetic force of the earth
D. force of attraction
E. force of repulsion

::A:: ::B:: ::C:: ::D:: ::E::

3 In which of the following is friction a help?

A. leaning a ladder against a wall
B. walking on a polished floor
C. applying the brakes on a moving bicycle
D. climbing a tree
E. in all the above

::A:: ::B:: ::C:: ::D:: ::E::

4 Pick out the statement which is false.

A. Friction wears things out
B. Friction produces heat
C. Friction always acts in the direction which opposes the motion
D. Friction is greater if the surfaces rubbing against each other are small
E. Friction is reduced by lubrication

::A:: ::B:: ::C:: ::D:: ::E::

5 Which statements are true?

I. If an object is thrown into the air, it will fall back because of the force of gravity
II. The force of gravity causes an object to have weight
III. The earth has a greater force of gravity than the moon because the earth is bigger
IV. An object which weighs 10 newtons on the earth will weigh the same on the moon

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

6 Choose the statement which is false.

A. The earth's gravitational pull can be measured with a spring balance
B. The earth's gravitational pull on a mass is the same at any place on the earth
C. The earth's gravitational pull is greater in a valley than on top of a high mountain
D. The earth has gravitational pull on a mass which is in outer space
E. A planet which has a bigger mass than the earth will have a greater gravitational pull

::A:: ::B:: ::C:: ::D:: ::E::

7 The lower end of a spring is opposite the zero mark on a scale when no load is attached to it. With a load of 2 newtons the lower end is pulled down to the 4 mark.

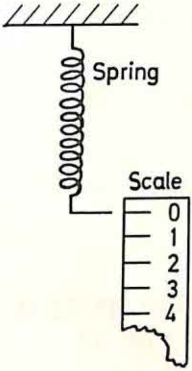


fig 44

a. What will the reading be if a load of 1·5 newtons is hung on the lower end of the spring?

A. 0 mark
B. 1 mark
C. 2 mark
D. 3 mark
E. 4 mark

::A:: ::B:: ::C:: ::D:: ::E::

b. What will the reading be for a load of 2·5 newtons?

A. 3 mark
B. 4 mark
C. 5 mark
D. 6 mark
E. 7 mark

::A:: ::B:: ::C:: ::D:: ::E::

c. A load is hung on the spring and its lower end is opposite the 1 mark. How heavy is the load?

A. 0·1 newton
B. 0·2 newton
C. 0·3 newton
D. 0·4 newton
E. 0·5 newton

::A:: ::B:: ::C:: ::D:: ::E::

8 A vertical spring is 4 cm long when there is no load hanging from it. With a load of 0·3 newton it stretches to 7 cm.

a. What length will it be when a load of 0·6 newton is hanging from it?

A. 8 cm
B. 9 cm
C. 10 cm
D. 11 cm
E. 12 cm

::A:: ::B:: ::C:: ::D:: ::E::

b. If the length of the spring is stretched to 13 cm what load is hung on it?

A. 0·7 newton
B. 0·8 newton
C. 0·9 newton
D. 1·0 newton
E. 1·1 newtons

::A:: ::B:: ::C:: ::D:: ::E::

9 Spring X is exactly the same as springY, but spring X is half the length of spring Y. A load of 10 newtons stretches spring X by 4 cm. How much will 10 newtons stretch spring Y?

A. 2 cm
B. 4 cm
C. 6 cm
D. 8 cm
E. 10 cm

::A:: ::B:: ::C:: ::D:: ::E::

10 Spring P and spring Q are exactly the same. When a load of 0·5 newton is attached to each one in turn, each stretches 2 cm.

a. If the springs are arranged as shown in the diagram below, how much will it stretch if a load of 0·25 newton is attached to it? (Neglect the weight of the springs)

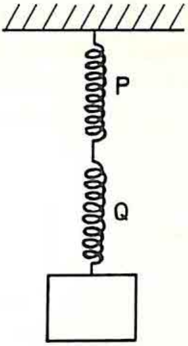


fig 45

A. 1 cm
B. 2 cm
C. 3 cm
D. 4 cm
E. 5 cm

::A:: ::B:: ::C:: ::D:: ::E::

b. If the springs are arranged as shown in the diagram below, how much will it stretch if a load of 1 newton is attached to it?

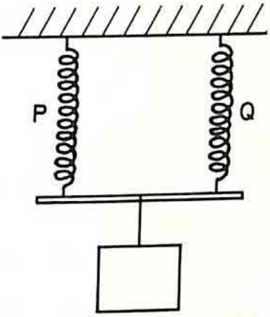


fig 46

A. 1 cm
B. 2 cm
C. 3 cm
D. 4 cm
E. 5 cm

::A:: ::B:: ::C:: ::D:: ::E::

11 A spring balance is made by using a broad rubber band as the spring. Different weights are hung on the rubber band and the extensions are measured. The table below gives the results.

Number of newtons	1	2	3	4	5
Extension in cm	4	8	12	16	20

a. If an object produced an extension of 14 cm, with what force is it pulling on the rubber band?

A. 2 newtons
B. 2·5 newtons
C. 3 newtons
D. 3·5 newtons
E. 4 newtons

::A:: ::B:: ::C:: ::D:: ::E::

b. If an object produced an extension of 28 cm, with what force is it pulling on the rubber band?

A. 4 newtons
B. 5 newtons
C. 6 newtons
D. 7 newtons
E. 8 newtons

::A:: ::B:: ::C:: ::D:: ::E::

c. If an object exerts a force of 1·5 newtons on the rubber band, what extension will it produce?

A. 5 cm
B. 6 cm
C. 7 cm
D. 8 cm
E. 9 cm

::A:: ::B:: ::C:: ::D:: ::E::

d. If an object can exert a force of 8 newtons on the rubber band, what extension do you expect it to produce?

A. 28 cm
B. 29 cm
C. 30 cm
D. 31 cm
E. 32 cm

::A:: ::B:: ::C:: ::D:: ::E::

e. If you plot a graph, using the results of the experiment, which diagram below indicates the type of graph you should expect?

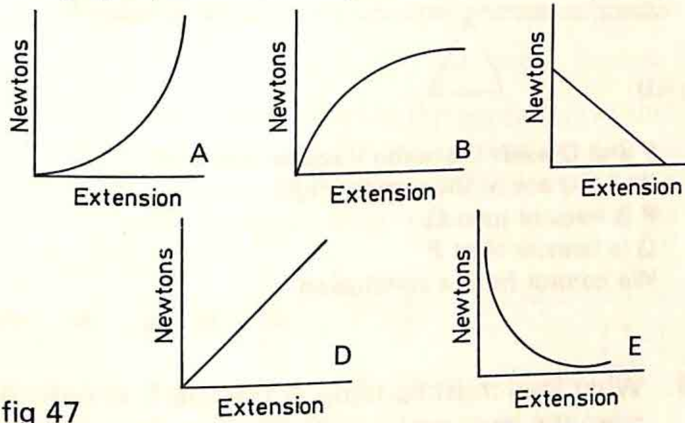


fig 47

::A:: ::B:: ::C:: ::D:: ::E::

12 What is the pull of the earth on a mass of one kilogram at sea level?

A. 5 newtons
B. 7 newtons
C. 9·5 newtons
D. 9·8 newtons
E. more than 10 newtons

::A:: ::B:: ::C:: ::D:: ::E::

13 Which statements are correct?

I. One newton is equal to 100 g
II. One newton is about the same as 100 g wt
III. The short form for two newtons is 2N
IV. The effort we use in lifting a load can be measured in newtons

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

14 In the diagram below, P balances Q.

Which one of the following statements is true?

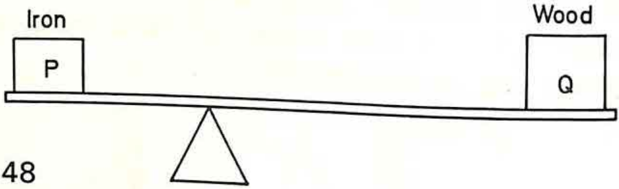


fig 48

A. P and Q exert the same force on the lever
B. P and Q are of the same weight
C. P is heavier than Q
D. Q is heavier than P
E. We cannot form a conclusion

::A:: ::B:: ::C:: ::D:: ::E::

15 What load must be hung at the end B in order to keep the lever horizontal? (Neglect the weight of the lever)

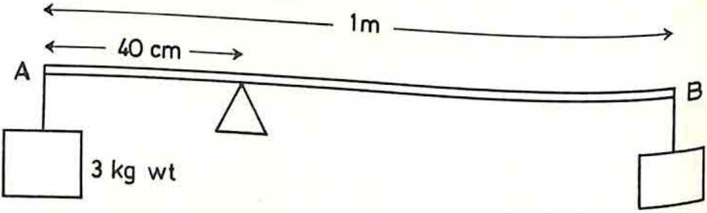


fig 49

A. 1·2 kg wt
B. 2 kg wt
C. 4·5 kg wt
D. 800 kg wt
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

16 In the diagram shown below, a boy can only use an effort of 25 kg wt to lift the load of 40 kg wt. At what distance from the pivot must he apply his effort?

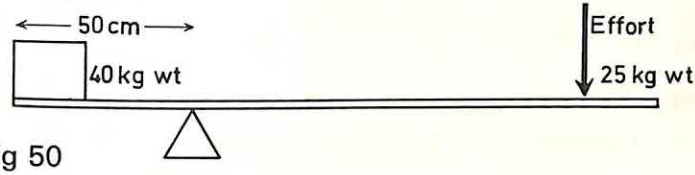
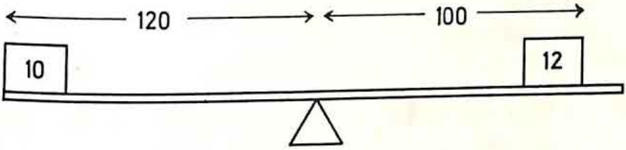


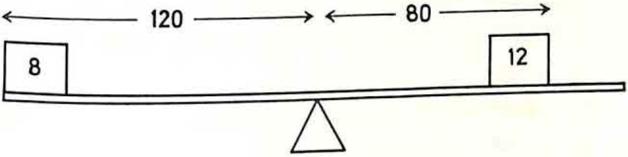
fig 50

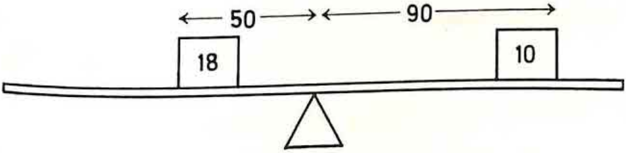
A. 2 cm
B. 20 cm
C. $31\frac{1}{4}$ cm
D. 80 cm
E. none of these

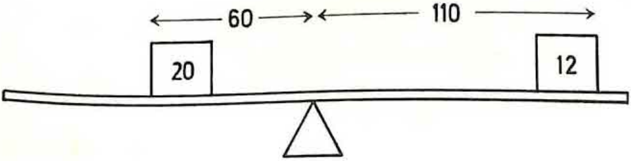
::A:: ::B:: ::C:: ::D:: ::E::

17 In each diagram below, the support is at the mid-point of the plank. Two loads rest on each plank. The loads are in kilogram weights and the distances are in centimetres. Which plank will be unbalanced?

A


B


C


D


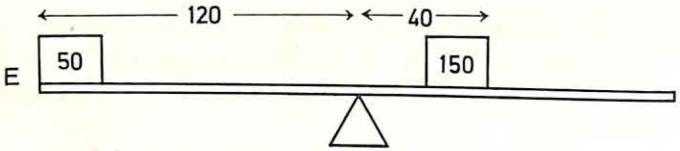


fig 51

::A:: ::B:: ::C:: ::D:: ::E::

18 The diagram shows a pair of pincers. If the force F applied is 10 g wt, the force acting on the nail is

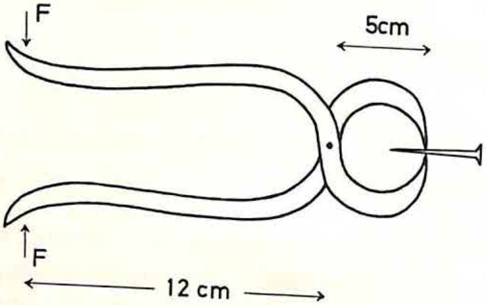


fig 52

A. 6·6 g wt
B. 9·6 g wt
C. 24 g wt
D. 60 g wt
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

19 A boy weighing 40 kg wt sat at a distance 1·5m from the supporting point of a see-saw. What was the weight of a girl who sat 3m from the supporting point in order to balance the boy?

A. 15 kg wt
B. 20 kg wt
C. 30 kg wt
D. 40 kg wt
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

20 Which statements are correct?

I. Forces occur in pairs
II. For any action by a force, there is a reaction
III. Action and reaction are equal
IV. Action works in one direction, and reaction works in the opposite direction

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. all are correct

::A:: ::B:: ::C:: ::D:: ::E::

21 A block of wood rests on top of a table. If the action on the table is the weight of the wood, the reaction is

A. equal to the weight of the table
B. equal to the weight of the wood and acts upwards on the wood
C. equal to the weight of the wood and acts downwards on the table
D. equal to the weight of the table minus the weight of the wood
E. equal to the weight of the table plus the weight of the wood

::A:: ::B:: ::C:: ::D:: ::E::

22 Two boys P and Q of equal weight stand on two similar trolleys, one holding each end of a string. If P pulls the string, then

A. P moves towards Q, while Q is at rest
B. Q moves towards P, while P is at rest
C. neither P nor Q moves
D. both P and Q move and meet each other at the centre
E. both P and Q move, but P moves faster than Q

::A:: ::B:: ::C:: ::D:: ::E::

23 The force which moves a rocket forwards in space is due to

A. the force produced by the gases escaping backwards and setting up an opposite force
B. the pressure of the escaping gases against the air
C. the force set up inside the rocket
D. the gases turning an engine inside the rocket
E. kinetic energy being changed into chemical energy

::A:: ::B:: ::C:: ::D:: ::E::

Work and energy

24 One unit used for measuring work is

A. the joule
B. the newton
C. the kilogram
D. the kilogram weight
E. the gram weight

::A:: ::B:: ::C:: ::D:: ::E::

25 One joule is the same as

A. one kilogram weight
B. one kilogram
C. one gram
D. one newton
E. one newton metre

::A:: ::B:: ::C:: ::D:: ::E::

26 Which of the following affect work done on a body?

I. force used
II. distance moved by force
III. time taken
IV. area covered

A. I, II and III
B. I and III
C. I and II
D. I only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

27 Choose the incorrect fact, if any.

A. Work is done when a force produces motion
B. Work = force x distance in direction of force
C. Anything which is able to do work is said to have energy
D. The joule is a unit for work as well as for energy
E. All the facts are correct

::A:: ::B:: ::C:: ::D:: ::E::

28 In which of the following is work not done?

A. An engine is puliing a train
B. A crane is lifting a heavy box
C. A labourer is carrying bricks up a ladder
D. A man is supporting a bag of rice on his shoulders
E. A boy is running up a staircase

::A:: ::B:: ::C:: ::D:: ::E::

29 How much work is done when a force of 10 newtons acts through a distance of 10 metres?

A. 100 joules
B. 10 joules
C. 1 joule
D. 100 kilogram weight
E. 10 kilogram weight

::A:: ::B:: ::C:: ::D:: ::E::

30 A boy weighing 400 newtons climbs a vertical ladder 8 metres high. How much work does he do against his own weight?

A. 3,200 kilogram weight
B. 3,200 joules
C. 50 joules
D. 50 newton metres
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

31 A mass of 2 kg falls through a height of 20m. How much work is done by the mass? (Take 1 kg wt = 10N)

A. 400J
B. 200J
C. 40J
D. 10J
E. none of these

::A:: ::B:: ::C:: ::D:: ::E::

32 A man pushes a barrow with a force of 150N and moves it a distance of 30m.

a. How much work does the man do?

A. 4,500 Nm
B. 4,500N
C. 4,500 kg wt
D. 5J
E. 5 Nm

::A:: ::B:: ::C:: ::D:: ::E::

b. From where does the man get the energy?

A. from the friction between the barrow and the road
B. from the force of gravity exerted on the barrow
C. from the barrow itself
D. from the food he ate
E. from the oxygen used by the body

::A:: ::B:: ::C:: ::D:: ::E::

33 When a horse is pulling a cart, the horse does work in overcoming the force of

A. gravity
B. friction
C. attraction
D. repulsion
E. the earth

::A:: ::B:: ::C:: ::D:: ::E::

34 When a boy lifts a box off the ground, he does work against the force of

A. attraction
B. repulsion
C. gravity
D. friction
E. magnetism

::A:: ::B:: ::C:: ::D:: ::E::

35 When a box is lifted off the ground, the work done is equal to the ...... which the box has at its height.

A. kinetic energy
B. potential energy

C. chemical energy
D. sound energy
E. gravitational pull

::A:: ::B:: ::C:: ::D:: ::E::

36 Which statement is incorrect?

A. Kinetic energy is the energy which a moving body has
B. Potential energy is the energy which a body has because of its position or state
C. A machine can transform one kind of energy into another
D. A machine can multiply energy
E. Energy cannot be destroyed

::A:: ::B:: ::C:: ::D:: ::E::

37 The potential energy of a raised body is equal to

A. its mass
B. its weight
C. its weight x its height
D. its height measured in metres
E. the force exerted on it by the earth

::A:: ::B:: ::C:: ::D:: ::E::

38 A boy lifted a load through a vertical height as shown in the diagram below.

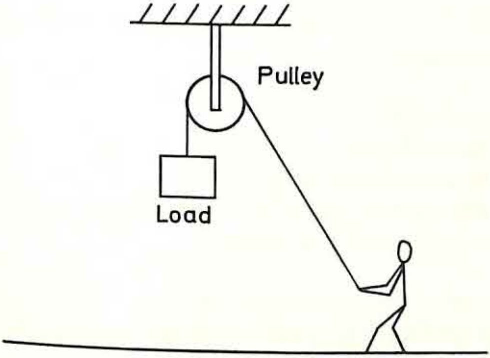


fig 53

Which statement, if any, is false?

A. The boy made use of the chemical energy from his body
B. The chemical energy was changed into kinetic energy during the time the load was rising

C. Work was done when the load was lifted
D. The work done was stored up in the load as potential energy
E. All the statements above are true

::A:: ::B:: ::C:: ::D:: ::E::

39 A boy used a block and tackle to help him raise a load of 1,000N. What effort did he use?

A. about 2,000N
B. about 1,500N
C. 1,000N
D. less than 1,000N
E. no effort was required

::A:: ::B:: ::C:: ::D:: ::E::

Support in plants

40 Pond weeds are able to keep erect in water but not on land because

A. of the buoyancy of the water
B. of their size
C. of their weight
D. of their shape
E. of the structure of their leaves

::A:: ::B:: ::C:: ::D:: ::E::

41 Which of the following gives support in young seedlings?

A. the root hairs
B. the seed shoots
C. the shape of the cells
D. the size of the cells
E. the turgidity of the cells

::A:: ::B:: ::C:: ::D:: ::E::

42 The cells in a seedling become turgid when they

A. absorb sunlight
B. absorb water
C. absorb oxygen
D. absorb carbon dioxide
E. store starch

::A:: ::B:: ::C:: ::D:: ::E::

43 Which statements are correct?

I. In small land plants, such as young seedlings, support is mainly due to the turgidity in their cells
II. In small water plants, such as pond weeds, support is due to the buoyancy of the water
III. In trees support is due to the woody tissue
IV. Cells become turgid when they have absorbed sufficient water

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

Support in animals

44 Choose the statements which are true.

I. Earthworms can maintain their shape because of their body fluids
II. Insects can maintain their shape because of their hard external skeleton
III. Fish can maintain their shape because of their scales
IV. Mammals can maintain their shape because of their internal skeleton

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

45 Which of the following actions will help an animal to support its body?

I. splay out the legs
II. close up the legs
III. arch the backbone with a muscle tie between the two ends of the arch
IV. straighten the backbone

A. I only
B. III only
C. I and III
D. II and IV
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

46 Which of the following factors affect support in an animal?

I. length of the leg bones
II. thickness of the leg bones
III. arched backbone
IV. covering on the skin

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

47 Which statements are true?

I. The supporting power of the legs of an animal depends on the cross-sectional area of the leg bones
II. The supporting power of the legs of an animal depends on the length of the leg bones
III. A rhinoceros requires shorter and broader legs than a giraffe because it has a much heavier body
IV. Short legs break more easily than long legs of the same thickness

A. I, II and III
B. I and II
C. III and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

48 Compared with a whale, a horse has bones which are much bigger in proportion to its size. Which statements below help to explain this difference?

I. A whale is a bigger animal than a horse
II. A whale is buoyed up by water

III. A horse has to support its own weight
IV. A horse is a runner

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

49 Choose the false statement.

A. The upthrust of the water helps a water animal to support its weight
B. Whales are able to grow bigger than land animals partly because the weight of a whale is greatly supported by the buoyancy of the water
C. Animals which live in water do not depend on their legs for support as much as land animals do
D. If a whale is lifted out of water, it will not be able to support its own weight
E. All water animals have an air bladder in the body to make their body more buoyant

::A:: ::B:: ::C:: ::D:: ::E::

50 The legs of a giraffe are splayed out in order to

A. get minimum stability
B. get maximum stability
C. rest the legs
D. lessen the weight of the body on the legs
E. lower the height of the animal

::A:: ::B:: ::C:: ::D:: ::E::

51 What are the main functions of the skeleton of an animal?

I. to give support
II. to give shape
III. to protect internal organs
IV. to make muscles

A. I, II and III
B. I and III
C. II and IV

D. I only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

52 Choose the false statement.

A. The centre of gravity of a body is the point through which all its weight seems to act
B. Objects which have a broad heavy base have a low centre of gravity
C. It is difficult to balance a long stick upright on the palm of your hand because its centre of gravity is high
D. It is important to have the centre of gravity of a motor car high
E. It is easier to knock over a boy when he is standing on one foot because his centre of gravity is raised

::A:: ::B:: ::C:: ::D:: ::E::

53 Five similar blocks of wood are supported in five different ways and placed on a plank. If the plank is tilted gradually, and assuming no sliding takes place, which block will topple over first?

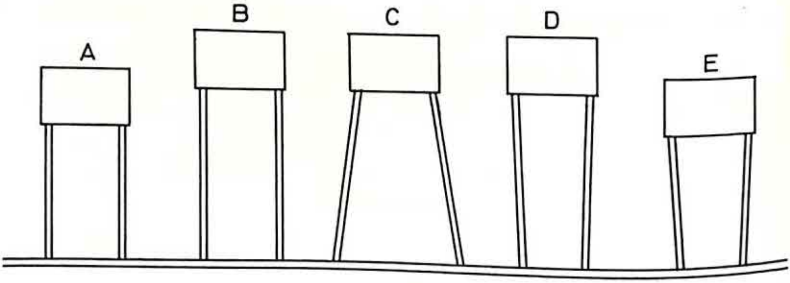


fig 54

::A:: ::B:: ::C:: ::D:: ::E::

54 In which of the following examples do stability and the centre of gravity not play a part?

A. A man leans forwards when climbing a hill and backwards when coming down
B. When you are standing in a moving bus, it is desirable to put your feet wide apart

C. When changing places in a rowing boat, it is not safe to stand upright to walk
D. In a double decker bus no passengers are allowed to stand on the upper deck
E. When you are cycling very fast, it is dangerous to brake suddenly

:A: :B: :C: :D: :E:

Muscles

55 Study the diagram below.

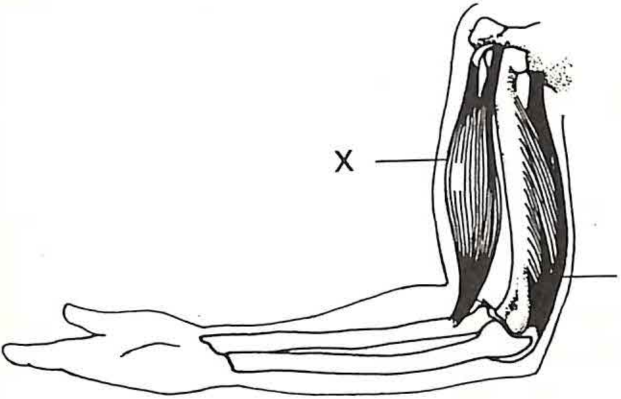


fig 55

a. The muscle labelled X is called the

A. biceps
B. triceps
C. tendons
D. ligaments
E. diaphragm

:A: :B: :C: :D: :E:

b. The muscle labelled Y is called the

A. biceps
B. triceps
C. tendons
D. ligaments
E. diaphragm

:A: :B: :C: :D: :E:

56 When the forearm is bent, the bones in the forearm turn. During this action, which part is acting as the pivot?

A. the bones in the forearm
B. the fingers
C. the finger joints
D. the elbow joint
E. the muscles in the forearm

::A:: ::B:: ::C:: ::D:: ::E::

57 When you are bending your forearm that is carrying a load, which part or parts act as the lever?

A. the bones in the forearm
B. the fingers
C. the finger joints
D. the elbow joint
E. the muscles in the forearm

::A:: ::B:: ::C:: ::D:: ::E::

58 When the forearm is bent, which of the following actions take place?

I. The biceps muscle contracts
II. The triceps muscle stretches
III. The bones in the forearm turn about the elbow joint
IV. The bones in the upperarm act as levers

A. I, II and III
B. I and III
C. II and IV
D. IV only
E. none of these combinations

::A:: ::B:: ::C:: ::D:: ::E::

Answers

1 Solvents and solutions

1	C	2	B	3	A	4	A	5	D
6	E	7	A	8	C	9	D	10	D
11	D	12	B	13	C	14	E	15	E
16	E	17	E	18	B	19	A	20	D
21	B	22	C	23	B	24	C	25	A
26	E	27	B	28	D	29(a)	A	29(b)	D
29(c)	C	30	B	31	A	32	A	33	E
34	B	35	E	36	B	37	B	38	A
39	C	40	D	41	A	42	C	43	E
44	D	45	A	46	C	47	E	48	D
49	A	50	E	51	A	52	E	53	B
54	A	55(a)	B	55(b)	E	55(c)	C	56	D
57	A	58	C	59	D	60	A	61	E
62	B	63	C	64	A	65	B	66	D
67(a)	A	67(b)	C	67(c)	A	67(d)	B	67(e)	D
67(f)	D	67(g)	E	68(a)	A	68(b)	C	68(c)	D
68(d)	E	69	E	70	B	71	C	72	C
73	A	74	B	75	A	76	B	77	B
78	A	79	E	80	D	81	A	82	C
83	E	84	A	85	B	86	E	87	C
88	B	89	C	90	E				

2 Some common gases

1	A	2	B	3	C	4	D	5	B
6	C	7	E	8	C	9	E	10	D
11	A	12	E	13	C	14	A	15	E
16	B	17	C	18	E	19	D	20	E
21	A	22	D	23	B	24	C	25	E
26	D	27	A	28	A	29	E	30	B
31	E	32(a)	B	32(b)	D	32(c)	A	32(d)	A
32(e)	C	33	D	34(a)	C	34(b)	A	34(c)	E
35	E	36	D	37	D	38	C	39	B
40(a)	B	40(b)	A	41(a)	D	41(b)	C	42	A
43	B	44	B	45	C	46	A	47	E
48(a)	A	48(b)	B	49	C	50	A	51	C
52	E	53	A	54	C	55	B	56	E
57	D	58(a)	C	58(b)	D	58(c)	B	59	D

60	A	61	E	62	A	63	B	64	E
65	A	66	C	67	B	68	C	69	E
70	C	71(a)	D	71(b)	B	71(c)	C	71(d)	E
71(e)	A	72	D	73	B	74	C	75	B
76	C	77	C	78	D	79	A	80	E
81	A	82(a)	A	82(b)	B	82(c)	D	82(d)	E
82(e)	E	82(f)	D	83	E	84(a)	A	84(b)	B
84(c)	C	84(d)	D	84(e)	E	85(a)	A	85(b)	D
85(c)	E	86(a)	A	86(b)	B	86(c)	E	86(d)	D
86(e)	A	87	A	88	C	89	D	90	B
91	D	92	E						

3 Making heat flow

1	A	2(a)	A	2(b)	E	2(c)	B	3	D
4	B	5(a)	A	5(b)	D	5(c)	C	6(a)	B
6(b)	A	6(c)	C	6(d)	C	6(e)	A	6(f)	B
7(a)	B	7(b)	E	8	E	9	B	10	B
11	C	12	E	13(a)	E	13(b)	B	14(a)	C
14(b)	A	15	C	16	B	17	E	18	C
19	D	20	A	21	A	22	E	23	C
24	A	25	C	26	B	27	A	28	E
29	E	30	D	31	C	32	D	33	E
34	D	35	D						

4 Hydrogen, acids and alkalis

1	C	2	B	3	A	4	B	5	A
6	D	7	E	8	E	9	E	10	E
11	C	12	D	13	D	14	C	15(a)	B
15(b)	B	15(c)	B	15(d)	A	15(e)	A	15(f)	A
15(g)	C	16	D	17	E	18	D	19	C
20	A	21	D	22	B	23(a)	C	23(b)	D
23(c)	B	24(a)	E	24(b)	C	24(c)	E	24(d)	A
24(e)	A	25	B	26	B	27	D	28	A
29	C	30	E	31	A	32	C	33	A
34	D	35	E	36	A	37	B	38	C
39	D	40	E	41	E	42	D	43	D
44	B	45(a)	A	45(b)	B	45(c)	C	45(d)	D

5 Detecting the environment

1(a) C	1(b) B	1(c) E	1(d) A	1(e) D
1(f) D	1(g) B	1(h) C	1(i) E	2(a) C
2(b) E	2(c) E	2(d) D	2(e) A	2(f) B
3(a) C	3(b) A	3(c) E	3(d) B	3(e) A
4 A	5 B	6 C	7 C	8 E
9 D	10 B	11 E	12 A	13 E
14 D	15 A	16 A	17 D	18(a) A
18(b) C	19 E	20 B	21 D	22 B
23 B	24 D	25 C	26 E	27 B
28 C	29 A	30(a) C	30(b) D	30(c) A
30(d) B	30(e) B	30(f) D	30(g) C	30(h) A
31 B	32 C	33 A	34 E	35 B
36 A	37 B	38 C	39 A	40 D
41 A	42 A	43 C	44 E	45 D
46 E	47 B	48 A	49 E	50 A
51 D	52 E	53 E	54 C	55 D
56 B	57 C	58 D	59 E	60 D
61 A	62(a) A	62(b) B	62(c) D	62(d) C
63 E	64 C	65 C	66 D	67 A
68 B	69(a) A	69(b) B	69(c) D	69(d) C
70 B	71 E	72 A	73 B	74 E
75 E	76 C			

6 Support and movement

1 E	2 B	3 E	4 D	5 A
6 B	7(a) D	7(b) C	7(c) E	8(a) C
8(b) C	9 D	10(a) B	10(b) B	11(a) D
11(b) D	11(c) B	11(d) E	11(e) D	12 D
13 E	14 C	15 B	16 D	17 D
18 C	19 B	20 E	21 B	22 D
23 A	24 A	25 E	26 C	27 E
28 D	29 A	30 B	31 A	32(a) A
32(b) D	33 B	34 C	35 B	36 D
37 C	38 E	39 D	40 A	41 E
42 B	43 E	44 E	45 C	46 A
47 A	48 E	49 E	50 B	51 A
52 D	53 D	54 E	55(a) A	55(b) B
56 D	57 A	58 A		